DOCUMENT RESUME

ED 168 553 IR 007 087

TITLE	Texas Telecommunication Satellite Demonstration Project. Planning Effort for Application of Communication Satellites in Education.
INSTITUTION	Education Service Center Region 4, Houston, Tex.
SPONS AGENCY	National Inst. of Education (DHEW), Washington, D.C.
PUB DATE	31 Mar 78
CONTRACT	400-77-0103
NOTE	354p.; Some pages may not reproduce clearly
AVAILABLE FROM	National Institute of Education or Region IV Education Service Center, P.O. Box 863, Houston, Texas 77001 (for Videotape describing the project)
EDRS PRICE	MF01/PC15 Plus Postage.
DESCRIPTORS	Communication Satellites; *Consortia; Educational Finance; *Educational Resources; Grants; *Information Dissemination; Information Networks; Information Systems; *Telecommunication
IDENTIFIERS	*Texas

ABSTRACT

The primary goal of the Texas Telecommunication Satellite Demonstration consortium is to install, operate, and evaluate a comprehensive communication service delivery system which would provide the citizens of Texas with greater opportunity for equal access to education and information. The four major objectives of the demonstration are (1) to install and operate a satellite-based communications system providing a technical capability to meet educational and information needs; (2) to involve service providers and clients in the development, operation, and evaluation of educational services; (3) to provide agencies in the state with experience in the development of program materials and services designed to meet the needs of those areas not now served by adequate telecommunication service; and (4) to extend and coordinate educational inservice and administrative services offered by state agencies. This report includes information on user needs, alternative approaches, operational plan, management plan, and budget. Appendices are included. (Author/JEG)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

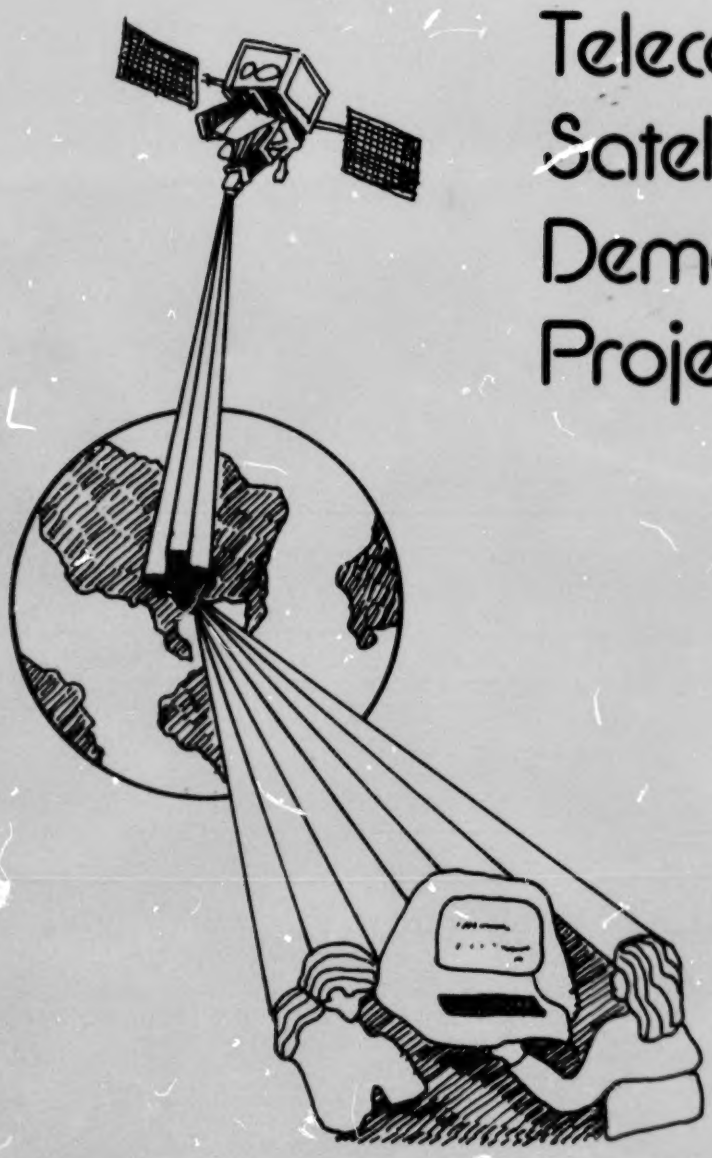
ED168553

IR

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Texas Telecommunication Satellite Demonstration Project



A Proposal to the
National Institute of Education by
Region IV Education Service Center
P.O. Box 863
Houston, Texas 77001

IR200708?

REGION

EDUCATION SERVICE CENTER

1750 SEAMIST • PHONE: AC/713 868-1051
MAILING ADDRESS: P. O. BOX 863 • HOUSTON, TEXAS 77001

EXECUTIVE DIRECTOR
Tom Pate, Jr.

BOARD OF DIRECTORS
W. L. Wheeler, Chairman
John Robinson
Chas. G. Dibrell, Jr.
N. A. Keithley
Robert J. Davis
Albert E. Hopkins
Frank G. Swindle

FROM: Texas Telecommunications Satellite Demonstration Project Staff

DATE: March 31, 1978

TO: National Institute of Education

RE: Project Report

This document is a report on the Planning Effort for Application of Communication Satellites in Education. The preparation of this document was in accord with Contract No. 400-77-0103 issued by the National Institute of Education (RFP-NIE-R-77-0012) for the period of October 1, 1977 through March 31, 1978.

A videotape overview of this document has also been submitted to the National Institute of Education and is an integral part of this report.

TABLE OF CONTENTS

Part I. Abstract 1

Part II. User Needs 3

A. Goal of Texas Telecommunication Satellite Demonstration (TTSD) 3

B. Members' Needs Assessments 13

Part III: Alternative Approaches 15

A. Alternative Technologies 15

B. Alternative Organizational Models 20

C. Guidelines 20

Part IV: Operational Plan 23

A. Participating Agencies 23

Development of Experiments 23

Services to be Delivered Via Satellite 26

Region IV Education Service Center 26

Texas A & M Agricultural Extension Service 39

Mental Health Mental Retardation 51

University of Texas Health/Science Center 57

American Education Complex 64

B. Consortium 71

Policy Development and Oversight 71

User and Citizen Participation 71

System Engineering 72

Administration and Fiscal Management 73

Evaluation and Research 73

Systems Operations 75

C. Technical Systems Requirements 80

D. The Initial System 83

Satellite Transponder Access 83

CATV Terminals 85

Microwave Connects 86

College Station 86

San Antonio 86

Ft. Worth 86

Dallas 85

Houston 87

San Angelo 87

Multi-Point Distribution 87

Control Center 87

E. Expanded System 88

ROTV Terminals 88

Microwave Extension 88

Texas Telecommunication Satellite Demonstration Transmit/Receive Earth Terminals 88

Public Broadcasting System Connects 89

Common Carrier Connects 89

F. General System Specification 90

Transmit/Receive Earth Terminals - Wideband 90

ROTV Earth Terminals 91

G. Maintenance Plan 93

Technical Assistance 94

CATV Systems Maintenance 94

H. Network Development 95

I. Letters of Commitment 99

Part V: Management Plan 119

A. Fiscal Agent and Board 119

B. Coordinating Committee 122

C. Users Advisory Committee 123

D. Director's Office and Information Services 124

E. Systems Operations 127

Director 128

Operations Research Analyst 128

Consulting 128

Programmer 128

Computer Clerk 128

Secretary 128

Data Base 129

Application Programs 129

Computer Hardware 133

Computer Software 133

F. Research and Evaluation 134

Evaluation by Participating Agencies 134

Evaluation at Consortium Level 134

Internal Evaluation 135

Special Studies 136

External Evaluation 136

Organization 136

G. Research and EValuation Staff 137

Evaluator 137

Special Studies Assistant 137

Technical Consultant 137

Administrative Secretary 137

H. Technical Services 139

I. Staffing 139

J. Program Implementation 140

Director: Technical Services 142

Assistant Director: Technical Services 142

Manager: Engineering Services 143

Manager: Systems Engineering 143

Manager: Engineering Support Services 143

Manager: Maintenance and Operations 144

Part VI: Budget 172

Appendices

I. Alternative Technologies: Detailed Cost and Routing Analysis

II. Comprehensive Staff Development and Administrative Conferencing Project Via Satellite Communications System, Texas Agricultural Extension Service, The Texas A & M University

III. Hardware Configurations, Circuitry, and Costs by TTSD Site

PART I: ABSTRACT

Within the State of Texas, with its size and geographic and socio-economic diversity, large state agencies and educational organizations have established vital links that require a continous flow of information. But the common practice of using the mails, couriers, telephone or physical travel are no longer adequate.

After extensive research and needs assessment, it was realized that the best way to establish and coordinate a broad-based education and information network was to explore the possibilities for gaining access to communication satellites.

A consortium was formed--Texas Telecommunication Satellite Demonstration--with primary goal to install, operate and evaluate a comprehensive communication service delivery system which will provide the citizens of Texas with greater opportunity for equal access to education and information.

Members include Region IV Education Service Center (the Fiscal Agent), Texas Department of Mental Health/Mental Retardation, University of Texas Health Science Center (San Antonio) and American Education Complex (Killeen). Affiliated members include The Association for Graduate Education and Research of North Texas, Texas Department of Human Resources, Texas State Library, and Governor's Office of Energy Resources.

The four major objectives of the demonstration are:

1. To install and operate a satellite-based communications system providing a technical capability to meet educational and information needs statewide.
2. To involve service providers and clients in the development, operation, and evaluation of educational services.
3. To provide agencies in the state with experience in the development of program materials and services designed to meet the needs of those areas and populations not now served by adequate telecommunication service.
4. To extend and coordinate educational inservice and administrative services offered by state agencies.

The experiments currently scheduled are: Braille Transmission of News to Students (narrowband); Interactive Guidance System (narrowband); Comprehensive Staff Development (video one-way, audio two-way); Administrative Conferencing (video one-way, audio two-way); Mental Health Care Continuing Education (video one-way, audio two-way); Continuing Education to Health Care Professionals (audio two-way, audio with slow scan, one & two-way); Solar Energy Public Awareness Project (audio two-way, audio with slow scan, one & two-way video).

Twenty-five sites comprise the initial system. The overall design is based on the philosophy of hybrid networking--interconnecting and sharing existing communications systems--with linkages to form a large, yet flexible system, unified with transmissions via satellites.

Two existing microwave systems (Texas Telecomputer Grid from San Antonio to Dallas and Fort Worth and TAGER's system connecting sites in North Texas) will be used. PBS stations (receiving signals from Westar I) and cable TV systems with a receiving satellite dish (RCA Satcom I) will be utilized.

Sites not on the microwave grid, yet served by cable TV systems, will use satellite dishes receiving RCA Satcom I transmissions. Sites near the existing microwave systems will have microwave extended to their facilities. The four largest metropolitan areas (which have no cable TV), will use multi-point distribution systems with telephone landlines for audio return.

By accessing the RCA satellite through the RCA uplink near Houston, the TTSD uplink to be constructed on the grid near Killeen, or through the uplink in Dallas, the entire one-way video, two-way audio network will be complete.

As the only comprehensive statewide demonstration, our efforts now will influence the communications we will soon take for granted--as the Texas Telecommunication Satellite Demonstration becomes an operational network in the 1980s.

PART II: USER NEEDS

A. Goal of the Texas Telecommunication Satellite Demonstration (TTSD).

The primary goal of the statewide satellite demonstration is to install, operate, and evaluate a comprehensive communication service delivery system which will provide the citizens of the State with greater opportunity for equal access to education and information. Since needs are many and varied for specific populations, a system is needed which can cover vast areas and, at the same time, can serve specific needs and circumstances. The use of satellites will provide the opportunity to add a new dimension to existing technologies. The resulting hybrid system will expand and improve a wide range of educational and information services presently being offered in the fields of education, health care, welfare, and other social services in both rural and urban areas across the State. To develop such a system in Texas brings with it special problems and challenges which result from the size, population, diversity and economic and social conditions in the State. The four specific objectives of the demonstration follow from the special needs and conditions of Texas.

Objective 1: To install and operate a satellite-based communication system providing a technical capability to meet educational and information needs statewide.

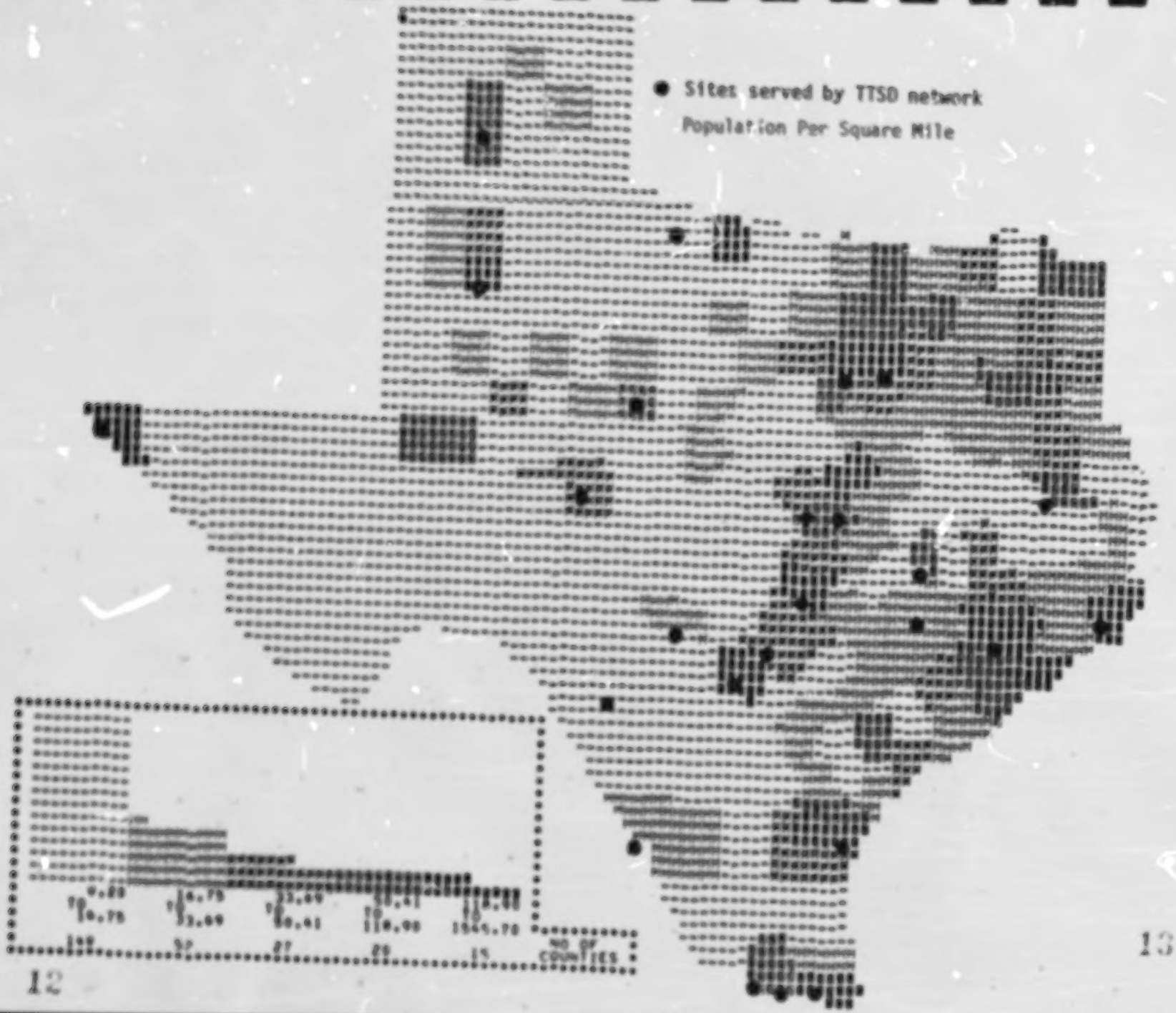
The geographical boundaries of Texas extend 800 miles both east to west and north to south. The State covers an area 1½ times the size of France. It encompasses 254 counties and more Standard Metropolitan Statistical Areas than any other state in the nation. Service delivery, to reach the Texas population, must occur in a large number of widely dispersed locations while simultaneously meeting the needs of a rapidly

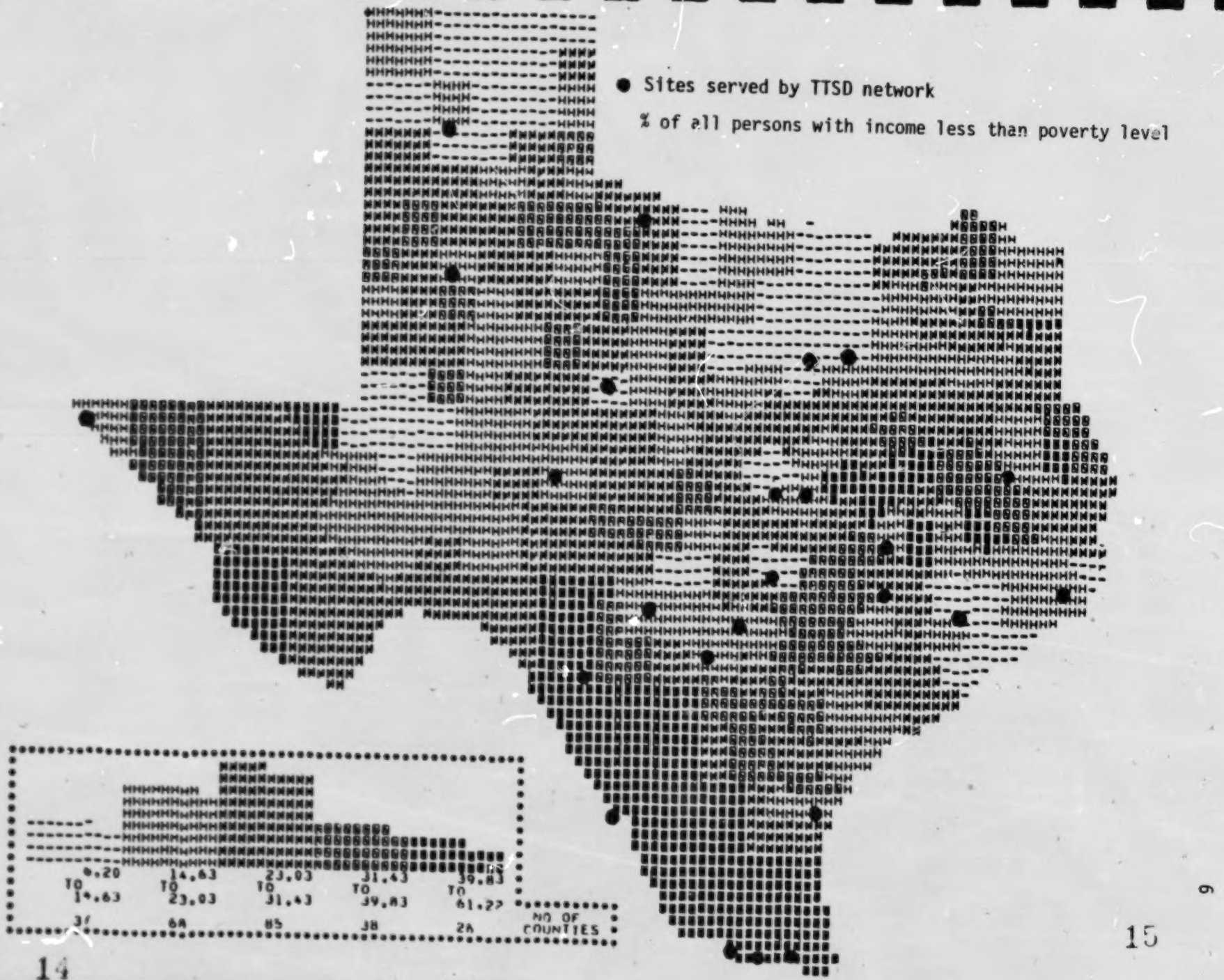
growing urban population (See Map on the following page).

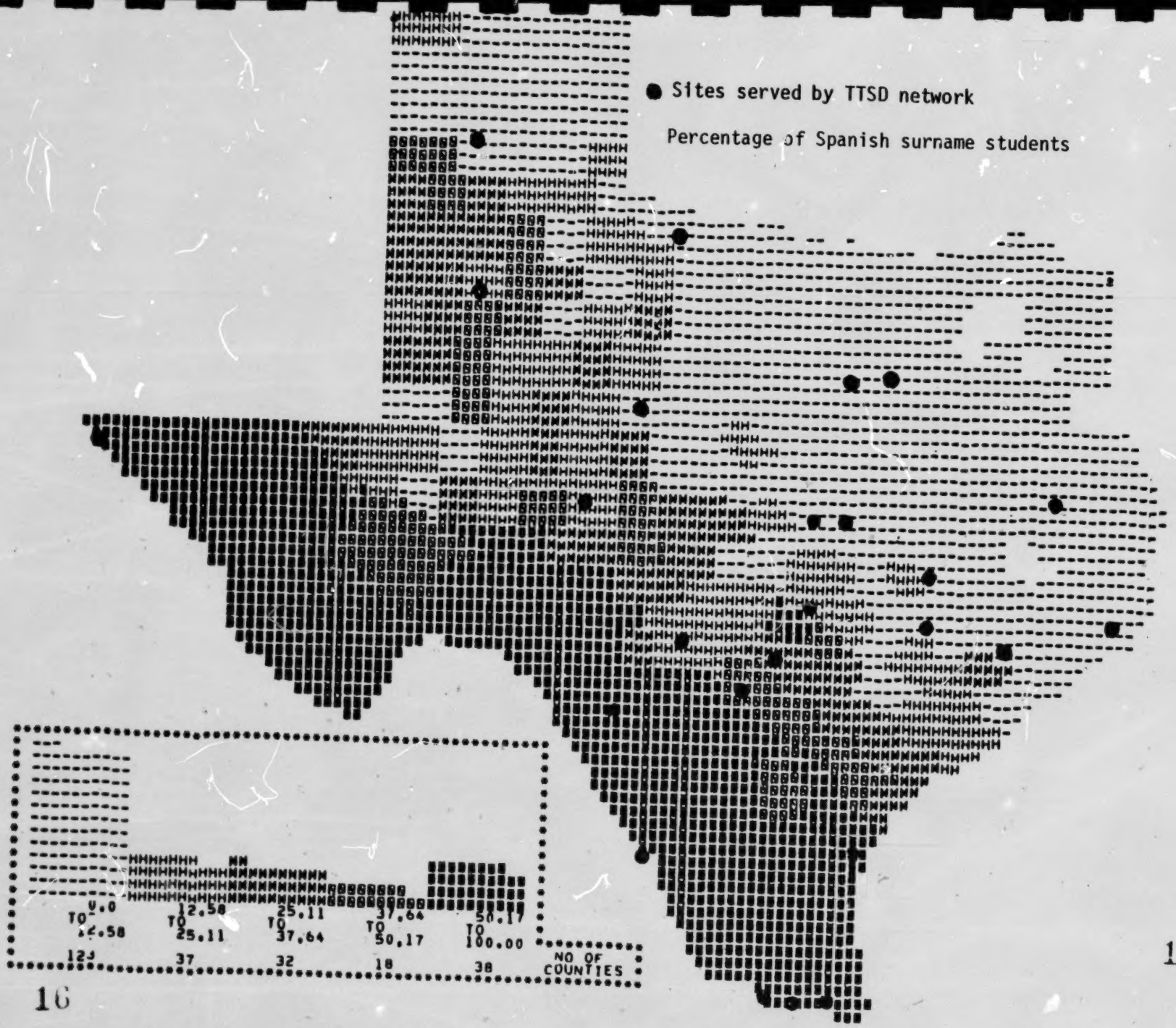
The size of the Texas population adds to the complexity of service delivery. Today, the State ranks third in population and growth is expected to continue at a steady pace. Projections for 1990 envisage a population of more than 18 million people.

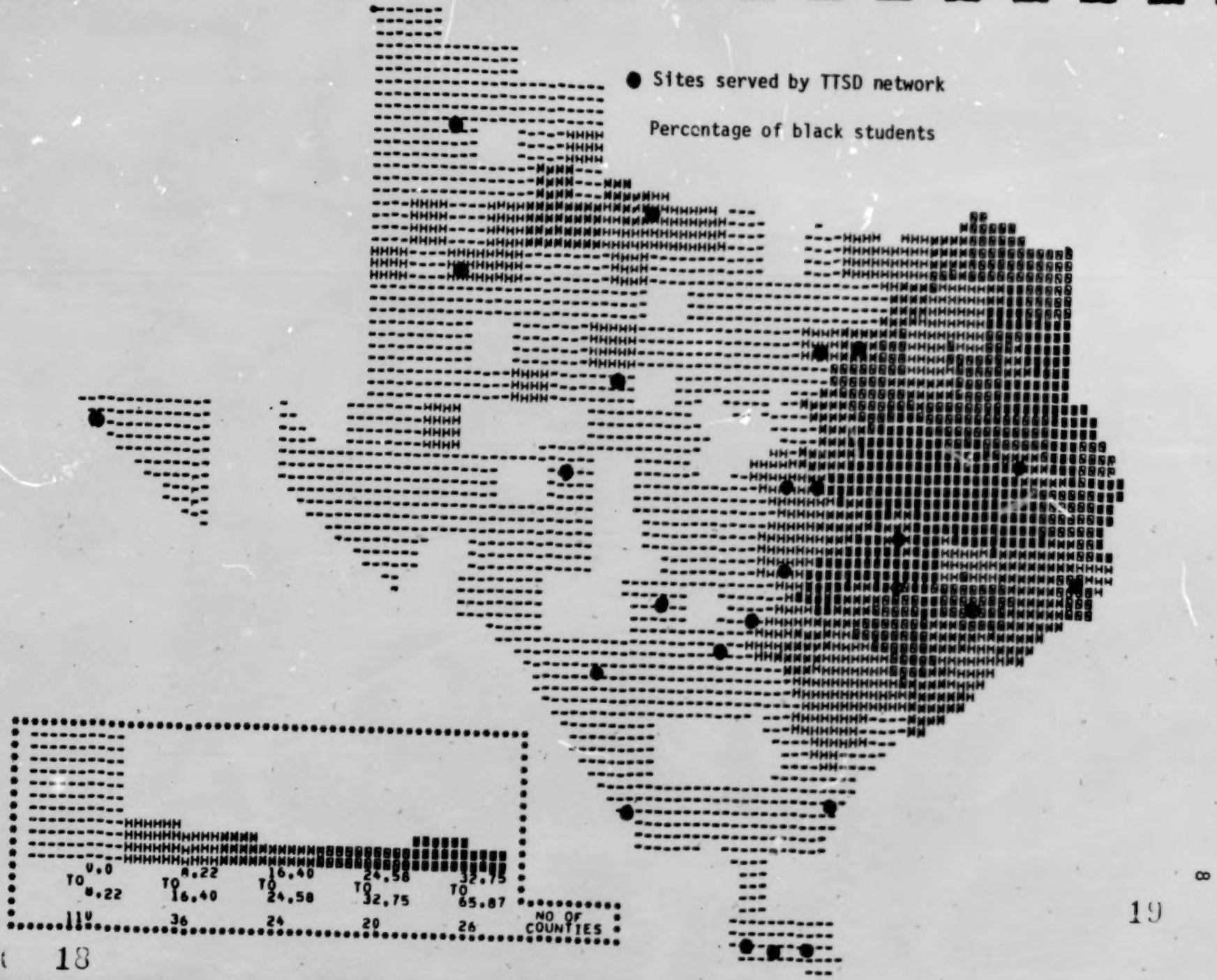
The Texas economy, while strong in most respects, is changing much faster than other parts of the country. The State must deal with the many problems directly associated with the transition from an economy mainly based on agriculture and exploitation of natural resources to a new dependence on manufacturing and services. This transition and the work requirements of the emerging economy call for a strong educational system capable of the continuing education of workers for present and future jobs, as well as meeting the social needs of the population. The total educational system must, likewise, be based on improving elementary and secondary instruction. Existing service delivery systems in many instances fall short of effectively covering the entire state.

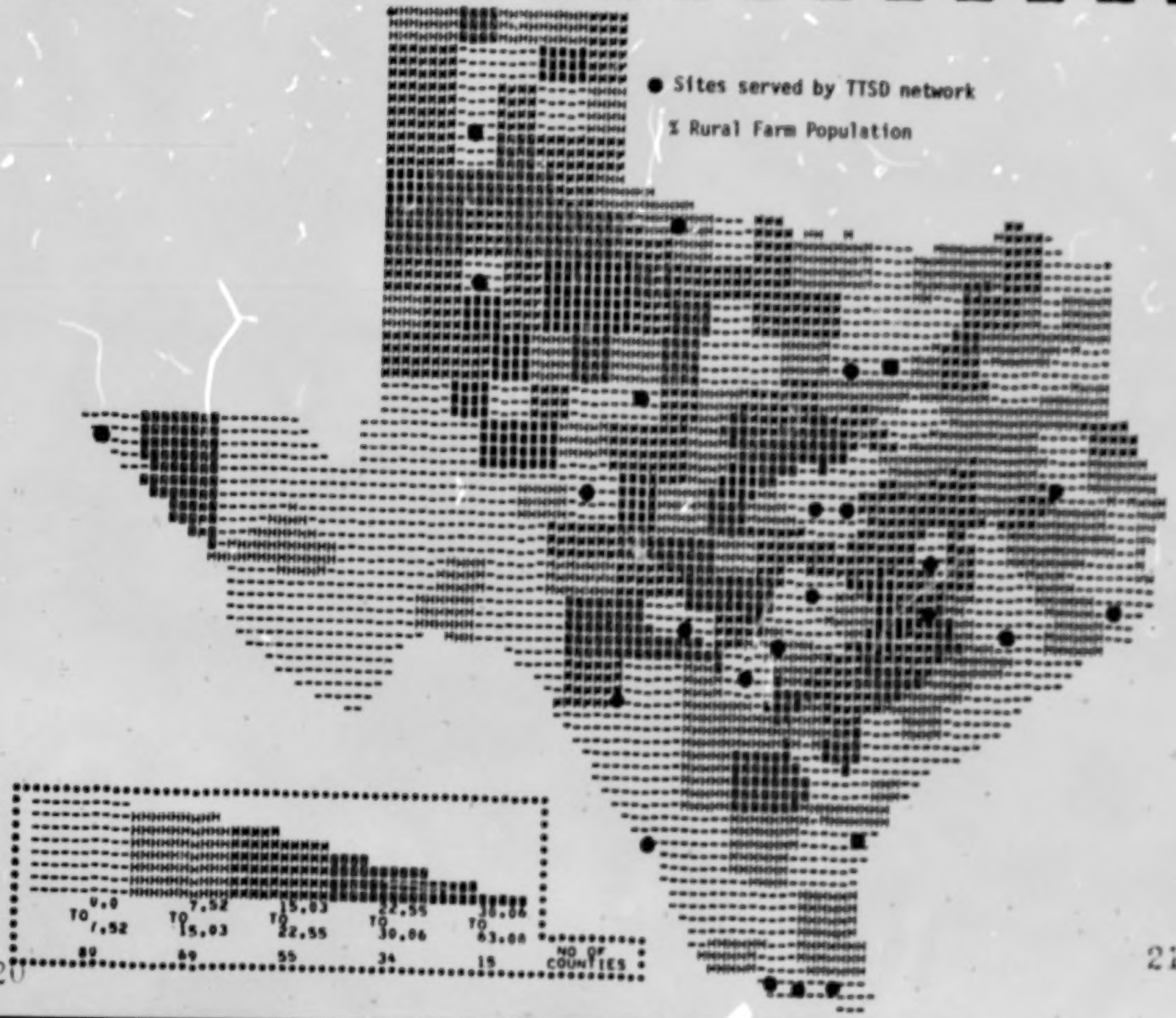
The population of the state includes large numbers of aged, poor, and racially disadvantaged groups. More than a third of the Texas aged live below the official poverty level (See map, page 6). Almost a third of the Texas population is either black or Mexican (See maps, pages 7 and 8). Approximately 20,000 Mexicans immigrate to Texas each year. Life expectancy of Mexican-American is much lower, and birth rates are much higher than for the rest of the population. The incidence of both urban and rural poverty is high. Texas rural areas, especially in South and East Texas, suffer from the highest rates of unemployment, lowest family incomes, greatest lack of adequate health care, and lowest educational achievement levels in the state (See map on page 9). The large


● Sites served by TTSD network
Population Per Square Mile
0.00 TO 0.75
0.75 TO 3.69
3.69 TO 10.41
10.41 TO 110.00
110.00 TO 1545.70
NO OF COUNTIES
199
52
87
89
15


● Sites served by TTSD network
% of all persons with income less than poverty level
0.20 TO 14.63
14.63 TO 23.03
23.03 TO 31.43
31.43 TO 39.83
39.83 TO 61.22
NO OF COUNTIES
37
68
85
38
28


● Sites served by TTSD network
Percentage of Spanish surname students
0.0 TO 12.58
12.58 TO 25.11
25.11 TO 37.64
37.64 TO 50.17
50.17 TO 100.00
125
37
32
18
38
NO OF COUNTIES


● Sites served by TTSD network
Percentage of black students
0.0 TO 8.22
8.22 TO 16.40
16.40 TO 24.58
24.58 TO 32.75
32.75 TO 65.87
110
36
24
20
26
NO OF COUNTIES


● Sites served by TTSD network
% Rural Farm Population
0.0 TO 7.52
7.52 TO 15.03
15.03 TO 22.55
22.55 TO 30.06
30.06 TO 63.08
89
69
55
34
15
NO OF COUNTIES

migrant worker population in many areas of South Texas and the Panhandle is barely connected to existing service networks.

The Office of Technology Assessment concluded in Feasibility and Value of Broadband Communications in Rural Areas (April, 1976, p. vi) that the increased use of telecommunications in rural areas, where population density is low, isolation prevalent, and mobility of individuals often reduced, can stimulate economic development by making these areas into more attractive areas for living and working.

The Interagency Task Force on Rural Communications reaffirmed this belief in 1977 (Interagency Task Force on Rural Communications, December, 1977). For these dreams to become a reality stronger federal programs and a more diversified system of funding these highly capital-intensive projects will have to be forthcoming. The economies of scale necessary to sustain present technology in remote, sparsely populated areas are a reality and the unified effort to exploit these economies is an integral part of TTSD.

TTSD will place special emphasis on reaching under-served areas and populations and developing educational and health programs specifically addressed to the problems of rural and minority populations. TTSD demonstrations will provide state agencies with experience in the development of program materials and services designed for the unique problems of disadvantaged groups.

The technical design and development of TTSD will use the hybrid networking approach. Maximum use will be made of existing technologies, with satellite transmission used as an additional capability. The objective is not to develop an entirely new communications system, but to integrate the satellite mode of transmission of services with other forms of telecommunications. Thus, it will become possible to assess the promises

and limitations of satellite transmission in comparison with existing systems which have often grown over considerable periods of time and represent sizable investments of capital. TTSD will provide for an opportunity to study the interface between different technologies and to assess the best mix of different distribution modes.

With this integrative purpose in mind, a great deal of effort was addressed during the planning period toward finding ways to utilize existing technologies to the maximum extent possible and to reserve satellite use for filling critical gaps. As a result, the proposal uses the Texas Telecomputer Grid which presently connects some of the large urban centers of the state. The same strategy is being used to integrate existing public television and cable networks in the state.

Objective 2: To involve service providers and clients in the development, operation, and evaluation of educational services.

To be effective, the services provided under the TTSD must meet the real needs of service recipients. Services offered under the demonstration program will be for staff agents in the field who will be responsible for translating information received to final consumers. Other services, to be offered during the second stage of the demonstration, will be addressed directly to individual consumers.

The demonstration will be structured in such a way to require intensive user participation, both at the staff and consumer levels, in the development, operation, and evaluation of individual experiments and of the entire demonstration. Arrangements for citizen participation will be activated early upon notification of grant approval. Advisory arrangements for user input will be used extensively in planning the postdemonstration phase of TTSD.

Objective 3: To provide agencies in the state with experience in the development of program materials and services designed to meet the needs of these areas and populations not now served by adequate telecommunication service.

Agencies participating in the demonstration program are experienced in the field of service delivery. They will use the telecommunications system as a tool for expanding and improving existing services and for developing new services which cannot be delivered with existing service delivery mechanisms. Participating agencies represent only a small segment of organizations responsible for delivery of services on a statewide basis. They are, however, representative of agencies with the mandate and resources to deliver educational services to various population groups. The experience gained by participating agencies during the demonstration will provide a research and information base which other agencies will be able to use in planning for their telecommunications needs and, in particular, in assessing the potential of satellite communications for their service environment.

The results of the demonstration will be of value to the entire State in assessing the costs and benefits of different technologies needed to meet future educational telecommunications needs of Texas. With this information in hand, the state will be better prepared to plan its educational service needs, as well as its overall needs for telecommunications capabilities during the rest of this century and well into the next. With sufficient lead time provided by a demonstration conducted now, the State will be prepared to take advantage of the potential of new technology and economies of scale in telecommunications. A well-developed telecommunications system, in addition, has potential impact for energy savings. Above all, the improvement of educational and social services will make an important contribution to the quality of life of all Texas citizens.

Objective 6: To extend and coordinate educational instructional and administrative services offered by state agencies.

The expansion of scale necessary to support a statewide telecommunications system requires the aggregation of service delivery by the state agencies. Scheduling and coordinating the provision of these services will facilitate cooperation among agency members participating in the demonstration and the operation of a statewide communications system. The demonstration will provide the necessary experience with cooperation among state agencies and provide policymakers with important information for establishing telecommunications priorities.

The demonstration will also serve the purpose of gaining initial experience in planning and implementing sharing arrangements between ITFS and demonstrations funded in other parts of the United States by the National Institute of Education and others.

5. Members' Needs Assessment

Each member of the Experimental Advisory Council conducted an internal needs assessment. The assessments included an examination of educational needs related to the individual agency's scope and goals. All experiments that were developed except two--Region IX Education Service Center's Interactive Guidance System and Seattle Translation--involve delivery of educational or administrative programming to staff agents--persons who will dispense educational services information or health care to the final recipient. However, in all cases, the decision to provide these educational or informational services is to benefit the final user: the client, the patient, and the student.

The decision to engage in the experiments listed in this plan was based upon each member's assessment of pressing user needs. The use of

satellite transmission would allow these agencies to verify their ability to provide current services for less cost, provide current services more effectively at the same cost, and/or provide new or better services at the same or slightly increased cost.

Details of the agencies' needs assessments appear in Part IV-A.

A videotape presentation describing the development of the Texas Telecommunication Satellite Demonstration and this report on the application of communication satellites in education may be requested from the National Institute of Education or Region IV Education Service Center:

Ralph Teter
Region IV Education Service Center
P. O. Box 863
Houston, Texas 77001

Telephone: 713/868-1051

PART III: ALTERNATIVE APPROACHES

A. Alternative Technologies

Within the State of Texas, six types of electronic communication technologies deliver a wide range of telecommunication services. Focusing on our needs to serve the citizens of Texas, with special emphasis on instructional/administrative clients in underserved areas, these existing technologies are to be considered first as we construct approaches to provide cost-effective service delivery within our network.

These technologies are the telephone, microwave, Instructional Television Fixed Service (ITFS), Multi-Point Distribution System (MDS), Broadcast Television and Radio, and Cable Television (CATV) systems. The only other method of service delivery -- physical transportation -- is considered as an element here only in that people who will take advantage of these services must travel to the nearest site to receive the information. This may be dozens of miles to reach a terminal point, or it may be from the bedroom to the living room. It should be noted that without the electronic technologies, clients do (or would have to) travel much further. This now means that some needed services are simply too costly. For the purpose of designing a statewide telecommunications system, we are considering this "reachability" factor as a crucial element in deciding where terminal points will be within a town only after site areas are chosen based on our previously defined user needs.

Target groups shape the configuration of this preliminary system, but once the backbone of the system is in place, it will undoubtedly provide the ability to deliver new services to new target groups via extensions of the primary system. For this reason, it is essential that great flexibility be incorporated into the design of this system, so that new technologies can be integrated into the delivery pathways. As stated earlier, this hybrid networking design has become an integral part of the TTSD philosophy as a result of extensive research into hardware

specifications and cost comparisons of network design configurations with concern for both present courseware requirements and projected services yet to be determined by affiliate members of the consortium.

The methods for delivering telecommunications services within the technical system being planned for the TTSD has evolved through several configurations since the Phase I planning proposal was written in July 1977. Originally, the system design and means of service delivery was modeled after the three major satellite demonstrations being conducted using NASA's four experimental satellites: ATS-1, -3, -6, and the CTS. After extensive research, it was realized that the growing unavailability factors concerning the use of these satellites, as well as the lack of adequate facilities throughout Texas to access these satellites, were major concerns affecting the development of the TTSD network.

A network of sites and services generated by the current and projected needs of consortium members showed that many remote points requiring 2-way capabilities also were in or near access to local CATV systems. Also, since installation of downlink sites for each user would require "last mile" links in every case, it was decided that TTSD would share the downlinks and last-mile interconnections already present at every CATV system in the state receiving Home Box Office, Showtime, Christian Broadcasting Network, or WTCG for its subscribers.

The remaining geographic areas which do not have CATV systems and do not use microwave routing to provide educational services are the four major metropolitan areas of Texas -- Houston, San Antonio, Dallas, and Ft. Worth. In these cities, Multi-point Distribution Systems provide a cost-effective method for intra-city distribution, where the downlink or signal source is located at each MDS transmitter. Alternative commercial common carriers such as the telephone system are priced in three network alternatives to be presented.

The only other alternative delivery method being investigated is the use of the PBS network throughout Texas where each PBS facility is able to access the WESTAR I satellite and can broadcast educational programming to TTSD target groups. Programming utilizing this mode of service delivery would have to be designed for general audiences and incorporated into each station's regular daily program schedule. No encoded programming (requiring decoders at each site), data, facsimile or narrowband services would be transmitted.

To test the validity of this hybrid concept, comparisons have been made using four system configurations--two without the use of satellites. Matrix 1 uses only the telephone system. Matrix 2 uses telephone, existing microwave, and existing ITFS systems. Matrix 3 adds the satellite, reaching all site areas, but continues to include local loop and interconnects using the telephone system for primary "last mile" distribution of both video and audio in areas with no CATV access. These three alternatives are detailed in Appendix I for cost and routing comparison. Matrix 4 details the complete hybrid system, adding a second microwave system and MDS for "last mile" video and audio distribution, including narrowband capabilities. The telephone system is used for all return audio from downlink sites, completing the 2-way audio capability for all sites not on the microwave systems. Matrix 4 represents the technical system configuration being planned for the TTSD and is detailed in Part V of this document.

A summary of the four alternatives are as follows:

Alternative I: Cost to provide 1-way video and 2-way voice service via full-time, leased Telco facility only.

A.	Cost for video portion	$251,924.00/month
B.	Cost for voice portion	7,424.00/month
	Total	$259,348.00/month

Alternative II: Cost to provide 1-way video and 2-way voice service via full-time, leased Telco facility only.

A.	Cost for video portion	$245,415.00/month
B.	Cost for voice portion	6,313.00/month
	Total	$251,728.00/month

Alternative III: Cost to provide 1-way video and 2-way voice service via satellite, Texas Telecomputer Grid (microwave), and "last mile" Telco facility.

A.	Cost for video via Telco intracity	26,775.00/month
B.	Cost for last mile voice via Telco (inter- and intracity)	6,313.00/month
C.	Cost for Texas Telecomputer Grid Microwave	14,000.00/month
D.	Cost for Satellite Service	15,167.00/month
	Total	$ 62,255.00/month

Alternative IV (the TTSD Plan):

Cost to provide 1-way video and 2-way voice service via satellite, Texas Telecomputer Grid (microwave with TTSD uplink), TAGER (microwave), CATV Systems, and MDS facilities with return audio via Telco facility.

A.	Cost for video via inter- and intracity Telco facility	0
B.	Cost for return audio via Telco inter- and intracity)	6,313.00/month
C.	Cost for Texas Telecomputer Grid Microwave (1)	14,000.00/month

D.	Cost for MDS intracity service	14,000.00/month
E.	Cost for satellite service	15,167.00/month
	Subtotal for comparing to Alternatives I, II, and III	49,480.00/month
F.	Cost for additional service area and access to second uplink via TAGER (microwave) (2)	3,500.00/month
	Total	$ 52,980.00/month

1. During the project period, any expenditure resulting from the maintenance and operation requirements of the existing Telecomputer Grid, not included in the tariff rate, will not be a financial responsibility of this project.

2. This cost includes two TTSD operated satelite uplinks plus an RCA uplink near Houston.

B. Alternative Organizational Models

Essentially there are four main management functions in the Texas Telecommunication Satellite Demonstration system:

- Program planning, development, presentation, and evaluation
- Technical networking and delivery
- Operations, including scheduling and tariff
- Budgetary control and fiscal management

In the proposal for Phase I, each of these functional areas was defined and a management team proposed that would coordinate each. Region IV Education Service Center, in submitting the proposal, assumed full fiscal and budgetary responsibilities.

Within this organizational context, this Phase II plan is being submitted. It is the feeling of the membership, however, that during the four-year course of the project, additional evolution in the organizational structure will occur. Two alternatives appear most promising: state commission and nonprofit corporation.

C. Guidelines

A review of the reports and evaluations of other satellite demonstrations reveals factors which contributed to the degree of success the projects experienced. These factors fell into three major categores: political, organizational, and technical.

- Political
  - Looking for continuing sources of funding early in the demonstration
  - Support within the institutions affected by the demonstration
  - Strong and firm commitments from top institutional officials
  - Taking full advantage of existing institutions which could provide valuable expertise and support

. . Organizational

. Facing and solving the dilemma posed by the economic need to provide a cost-effective network and still serving the user needs, especially in remote areas

. Recognizing the savings which could be realized through centralized procurement of large pieces of equipment

. Using field agents effectively by providing careful training and adequate feedback mechanisms

. Designing the demonstration as an experiment with controls leading to clear conclusions

. . Technical

. Placing hardware at locations to serve specific user needs

. Making efficient use of existing technology and networks

. Planning backup systems so that service can have a 99.9% reliability factor

. Examining the use of 1-way video and 2-way audio to the fullest extent possible

These factors have been integrated into the TTSD plan in the following ways:

. Building into the first year of the project design consideration of continued funding which will lead to a self-supporting network, through the implementation of a tariff;

. Developing a consortium of several institutions with firm letters of commitment from the major official of each;

. Planning for multiple-institution use of equipment at most sites, based on user needs, thus lowering per-user costs and making service to remote sites cost effective;

- Obtaining commitments from CATV operators, microwave systems, MDS systems, and PBS stations to cooperate in the project;
- Procuring all major equipment through the consortium;
- Using carefully trained agents in all experiments for onsite management of facility arrangements and program evaluation;
- Develop controls for the experiments by:
  - running similar or identical experiments on non-satellite transmission modes, and
  - identifying factors at the individual experiment and consortium levels which might affect the success of the project
- Making expensive use of existing land-based transmission networks to reduce costs; and
- Giving careful attention to the development of back-up systems.

PART IV: OPERATIONAL PLAN

A. Participating Agencies

Development of Experiments. During Phase I, it was determined that membership for Phase II was contingent upon an organization's commitment to implement an operational program at the beginning of Phase II of the Demonstration. Five agencies have completed preparatory activities and are ready to start their experiments upon funding of the proposal. Accordingly, the following agencies are full members of the Consortium at the outset of Phase II:

1. Region IV Education Service Center, Houston (ESC IV)
2. Texas Agricultural Extension Service, Texas A & M University System, College Station (TAEX)
3. Texas Department of Mental Health and Mental Retardation, Medical Services Continuing Education at Texas Research Institute of Mental Sciences, Austin and Houston (TRIMS)
4. University of Texas Health Science Center at San Antonio (UTHSC)
5. American Technological University, American Education Complex, Killeen (AEC)

In addition, several agencies have participated in various activities during Phase I and may become full members at a later stage. Initially, the following agencies will joint Phase II of the Demonstration as affiliate members:

1. The Association for Graduate Education and Research of North Texas, Richardson (TAGER)
2. Texas Department of Human Resources, Austin
3. Texas State Library, Austin
4. Governors Office of Energy Resources

To attain full member status, all preliminary program development activities as described for full members in this part of the plan must be completed.

The five full members of the Consortium will offer educational or administrative programming to highly motivated users. Users are either

individual consumers (as in the case of the ESC IV experiment) or staff agents transmitting centrally prepared information to individuals in the field (as in the case of the other three agencies).

All experiments build on existing educational programs and clients (See following page for overview of experiments). In most cases, what is new is not so much the programs as such, but the distribution of the programs. The goal is to improve the quality of the programming, to lower the costs of transmission, and/or to reach a wider audience with the same amount of resources. These conditions were carefully defined in order to provide meaningful control situations for the experiments undertaken during Phase II. Without controls, evaluation of comparative costs and benefits related to satellite transmission would be impossible. In most instances, the existing delivery modes will be operated in parallel with the satellite-based experiment. In some cases, the entire program will be converted to satellite operation in order to operate effectively. However, detailed comparisons (will be made) with previously gained experience with the same program.

Many of the proposed experiments are in the area of continuing education for professional or paraprofessional personnel. National needs assessments of educational developments in the next decade point to dramatically increasing demands in continuing education. Texas is no exception. There are definite possibilities for satellite-based education for elementary and secondary schooling, such as for handicapped children. Some of these will be explored during Phase II. Preliminary discussions with representatives of the Texas Education Agency (TEA) have been held, and TEA has been continually informed about all activities concerning the development of the TTSD. However, a conscious effort was made to concentrate the initial programming of the Demonstration on continuing education and education-related administrative services where unmet

OVERVIEW OF EXPERIMENTS

	Title	Agency	Bandwidth
#1	Braille Transmission of News Reports	ESC IV	Narrow
#2	Interactive Guidance System	ESC IV	Narrow
#3	Comprehensive Staff Development	TAEX	Video one-way Audio two-way
#4	Administrative Conferencing	TAEX	Video one-way Audio two-way
#5	Mental Health Care Continuing Education	MHMR	Video one-way Audio two-way
#6	Continuing Education to Health Care Professionals	UTHSC	Audio two-way Audio with slow scan One & two-way video
#7	Solar Energy Public Awareness Project	AEC	Audio two-way Audio with slow scan One & two-way video

ESC IV - Region IV Education Service Center

TAEX - Texas Agricultural Extension Service

MHMR - Texas Department of Mental Health and Mental Retardation

UTHSC - The University of Texas Health Science Center at San Antonio

AEC - American Education Complex.

needs are largest and the potential payoff massive.

Since all experiments offered during Phase II will be based on existing programs, service delivery can be expected to begin as soon as the technical requirements for satellite operation are met. This reduces the degree of uncertainty associated with any major institutional or technological change. All agencies offering experiments have been involved, often over long periods of time, in the development of educational programs. This is not to say, however, that program changes are limited to the technical aspects of service delivery. In order to make optimum use of the satellite mode of delivery, the content of existing programs needs to be carefully examined and adjusted. In many cases, the curriculum will be modified to take full advantage of video transmission. In other cases, new curricula will be developed to meet the needs of the enlarged audience which can be reached by satellite, and to take advantage of the lower cost per unit of transmission, especially to remote areas. All member agencies have staffs with the necessary experience to undertake the curriculum development work involved and to train any additional staff which might be needed to expand the programming. Plans describing these activities have been developed by the agencies involved and will be implemented, in parallel with the technical development of the system, during year one of the demonstration.

Services to be Delivered Via Satellite

Education Service Center, Region IV, Houston (ESC IV)

Agency Description: Region IV Education Service Center is located in Houston, Texas and serves fifty-four independent school districts and numerous private schools in a seven-county area that includes Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, and Waller Counties. Region IV provides a variety of educational services to districts in this area through programs which are funded from federal, state, and local sources.

Services provided fall in the following categories: resource services, instructional services, planning, program development and evaluation services, vocational education services, and administrative services. Each area of service has a user advisory committee to provide assessment information, operational direction, and evaluative data. At present, more than 550,000 elementary and secondary school students are served. The current annual budget exceeds $13 million.

Education Service Centers were established by an Act of the Texas Legislature in 1967. The centers are defined as local education agencies authorized to submit directly for funding from any source.

Experiment #5: Braille Transmission of News Reports

The main purpose of this experiment is to demonstrate the feasibility of transmission of hot print data to a remote computer for translation to Grade II Braille and retransmission of Braille to a remote embosser. Users of the service will be blind students, enrolled in social studies classes offered by the Texas State School for the Blind in Austin. The material to be transmitted will be taken from the current events information offered by the wire services. Students will be able to take advantage of news reports on the same day that the wire service transmits the information. The Texas State School for the Blind is eager to participate in the project.

ESC IV has been involved in translating textbooks into Braille for almost a year. Six textbooks dealing with high school mathematics were translated into Braille for the Texas Education Agency and are available through TSB. The blind and visually handicapped have heretofore been unable to obtain current reading materials.

An assessment of current problems associated with availability of braille texts to blind students was undertaken by ESC IV. Results of

the needs assessment pointed to the lack of current braille material. It was also found that the variety and timeliness of braille instructional material was likely to be further reduced in the future as fewer braille texts are being translated each year. Therefore, further development of computer assisted braille texts (as pioneered by the Atlanta School District and the Printing House for the Blind in Louisville, Kentucky) is needed. With the help of a grant received from the Texas Governor's Office for the Visually Handicapped, ESC IV was able to demonstrate a satisfactory braille II computer translated braille capability. Once this stage was reached, arrangements were made with the Houston Post Newspaper for a direct wire tie-in to the ESC IV computer. The computer file is being updated daily representing a mini-newspaper and is processed through the translation program. The file is accessible from any remote location by a braille embossing terminal.

Under the proposed experiment, recently developed low-cost embossing computer terminals will be used. Data will be translated to Grade II Braille and will be transmitted by satellite. Transmission by satellite serves two purposes: (1) to establish the feasibility of braille transmission via satellite as an alternative to landline transmission, (2) to gain experience with satellite transmission of braille information which could lead to the development of lower cost embossing terminals and making available current reading material to the blind in remote parts of the country.

The only new technology to be used in the experiment relates to satellite transmission, and no new software will be developed until after considerable experience with satellite transmission has been gained. During a later stage of the experiment, transmission via satellite to a variety of locations beyond the Texas State School for the Blind in Austin will

EXPERIMENT #1

PROJECT NAME: BRAILLE TRANSMISSION OF NEWS REPORTS
AGENCY NAME: REGION IV EDUCATION SERVICE CENTER, HOUSTON, TEXAS

Goal

To demonstrate the feasibility of satellite transmission of computer generated braille.

Important Assumptions

1. Continuing support from state and/or foundation sources for basic operation of the Braille project
2. That the Braille project will be self-sustaining within 36 months

Projective Objective

To deliver computer generated braille newspaper articles, career guidance system, and textbooks to four sites via satellite.

Expected Results	*Verifiable Indicators*	*Means of Verification*
1. 300 blind students at Austin State School for the Blind will participate in current events classes using braille wire news stories transmitted via satellite	1. The number of students using braille news reports.	1. Records kept at local schools.
2. Other schools with blind students will be added to the hybred communications network.	2. The number of schools added.	2. Records kept by Region IV ESC.

Activities

1. Acquire embossing terminals.
2. Install landlines to uplink disk.
3. Acquire personnel.
4. Train personnel.
5. Initiate transmission and remote embossing
6. Evaluate system.
7. Initiate search for additional clients

be tested. It is expected that success of the experiment in the case of the Texas State School for the Blind will encourage other schools with blind students to participate in the program. In addition, all schools connected to the ESC IV computer system will be able to use the news reports transmissions via landline.

Evaluation will take two forms: students and instructors of the Texas State School for the Blind will be asked to evaluate the new service. The quality of satellite transmission will be compared to transmission via landline. Beyond these formal evaluation activities, willingness of other schools to buy the service will be an important indicator of success.

Project staff from ESC IV will work closely with a group of instructors and students of the Texas State School for the Blind to receive user advice on all phases of the experiment.

Experiment #2: Guidance Information System

This experiment is designed to improve the delivery of guidance information to students in Texas. Each Texas school district is required under the law to provide adequate guidance services to all students. At present, the guidance program in schools consists mostly of bound material which is soon out of date. A computer-based guidance information system was begun in 1976, providing guidance information as an on-line resource to schools in Texas regions IV, V, and VI (Southeast Texas). Users are required to provide a terminal and budget for costs related to computer linkage and usage via telephone.

Under the experiment, satellite transmission will be tested in order to establish the feasibility of interactive dialogue with a remote computer. The information included in the system responds to a user's need for educational, vocational, career planning, and placement support

information. Information provided in each particular case is unique because the system allows the user to develop a range of options in terms of significant individual differences.

While the present landline system will be continued, the satellite experiment will provide the same kind of interactive computer-based guidance information to junior high and high schools in four locations. Locations selected are Houston, College Station, Beaumont, and Austin. Expansion to remote locations in the state at a later stage is planned, subject to successful operation of the experiment in the initial locations.

Information included in the interactive guidance system is briefly summarized below:

- The Occupational Information file contains approximately 1200 primary listings with references to an additional 3000 related jobs. Users can use interests and aptitudes associated with these jobs and determine education and training requirements, the kind of work involved, working conditions, salary ranges, and lifestyle characteristics.

- The Armed Services Occupations Section provides basic information on more than 100 occupations in the Armed Services. Each occupation described is referenced to civilian and military occupations.

- The Four-Year College File enables the user to explore more than 1500 colleges nationwide and regionally. Users select from more than 500 important characteristics to develop a variety of college options.

- The Two-Year College File includes more than 1200 national and regional colleges and technical training programs. Over 300 characteristics are available for use in developing options for specialized training.

- The Graduate School Information File contains information on hundreds of graduate schools, their programs, and placement requirements.

- A Financial Aids Information File contains information about national and state scholarships and financial aid programs.

User participation in the guidance project will take the form of advisory input from guidance counselors in participating schools. Evaluation will be based on a comparison of landline and satellite delivery

EXPERIMENT #2

PROJECT NAME: INTERACTIVE GUIDANCE SYSTEM
AGENCY NAME: REGION IV EDUCATION SERVICE CENTER, HOUSTON, TEXAS

Goal

To demonstrate the feasibility of satellite transmission of the interactive Guidance System.

Important Assumptions

1. District will continue present policy of covering cost of teletypewriters and communications.

Projective Objective

To deliver the Interactive Guidance System to junior high and high school students at four sites.

Expected Results	*Verifiable Indicators*	*Means of Verification*
1. Improved cost-effectiveness with staellite transmission of the Interactive Guidance System as compared with landline transmission.	1. Lowered cost per student.	1. Comparison of satellite transmission with landline transmission.
2. Ability to reach more students with the Interactive Guidance System, especially in remote areas.	2. Number of campuses and students reached.	2. Count of campuses and students served.

Activities

1. Identify specific sites (secondary schools)
2. Secure teletypewriters
3. Staff orientation
4. Implement program

of guidance information. At a later stage, response of schools not participating in the program during its experimental phase will be used as an important indicator of success.

An example of an additional specific needs assessment that will be carried out by Region IV Education Service Center as part of TTSD is the assessment plan for education computer services. The 1120 school districts of Texas are served by 20 Education Service Centers. Since their creation 11 years ago, one of their major chores has been that of furnishing computer services. The goal for the statewide network system for computer services is that of providing timely and accurate information in an economical manner to educational program managers at school district, regional and state levels to:

- . Support educational priorities.
- . Assist with program monitoring, evaluation and reporting.
- . Enhance instructional program improvement and renewal.

A network concept plan which has been developed is based on the premise that continuing statewide expansion will be realized through a computer network designed around large general-purpose computers interconnected with terminals and minicomputers to provide both batch and interactive processing services. The ultimate aim of the network concept is to have all regional education service centers served by multiregional processing centers. Each remote terminal will appear to operate as an independent computer insofar as the users are concerned. The use of narrowband satellite communications will contribute to making the statewide computer network system a reality.

Computer uses by Texas schools may be classified under two headings: instructional uses and noninstructional uses. Under instructional uses two categories; direct use and indirect use, are identified. Under noninstructional uses, two major categories exist; these are the

operational services (detail, transaction oriented) and the management services (decision oriented).

- . Instructional uses
  - . Direct
    - Computer Assisted Instruction
    - Simulation
    - Computerized Vocational and Guidance Counseling Information
    - Vocational Electronic Data Processing
  - . Indirect
    - Computer Managed Instruction
    - Information Search and Retrieval
- . Noninstructional uses
  - . Operational Services
    - Class Scheduling
    - Attendance Accounting
    - Grade Reports
    - Scoring Standardized Tests
    - Writing Payroll Checks
    - Maintaining Ad Valorem Tax Records
    - Recording Personnel Actions
  - . Management Services
    - School management personnel make decisions in the areas of planning programs, planning resource allocations, budgeting, operational control, and evaluation. These decisions must be made on the basis of the best information available. Most of these decisions are non-standard and should be made without long lead time for data collection.

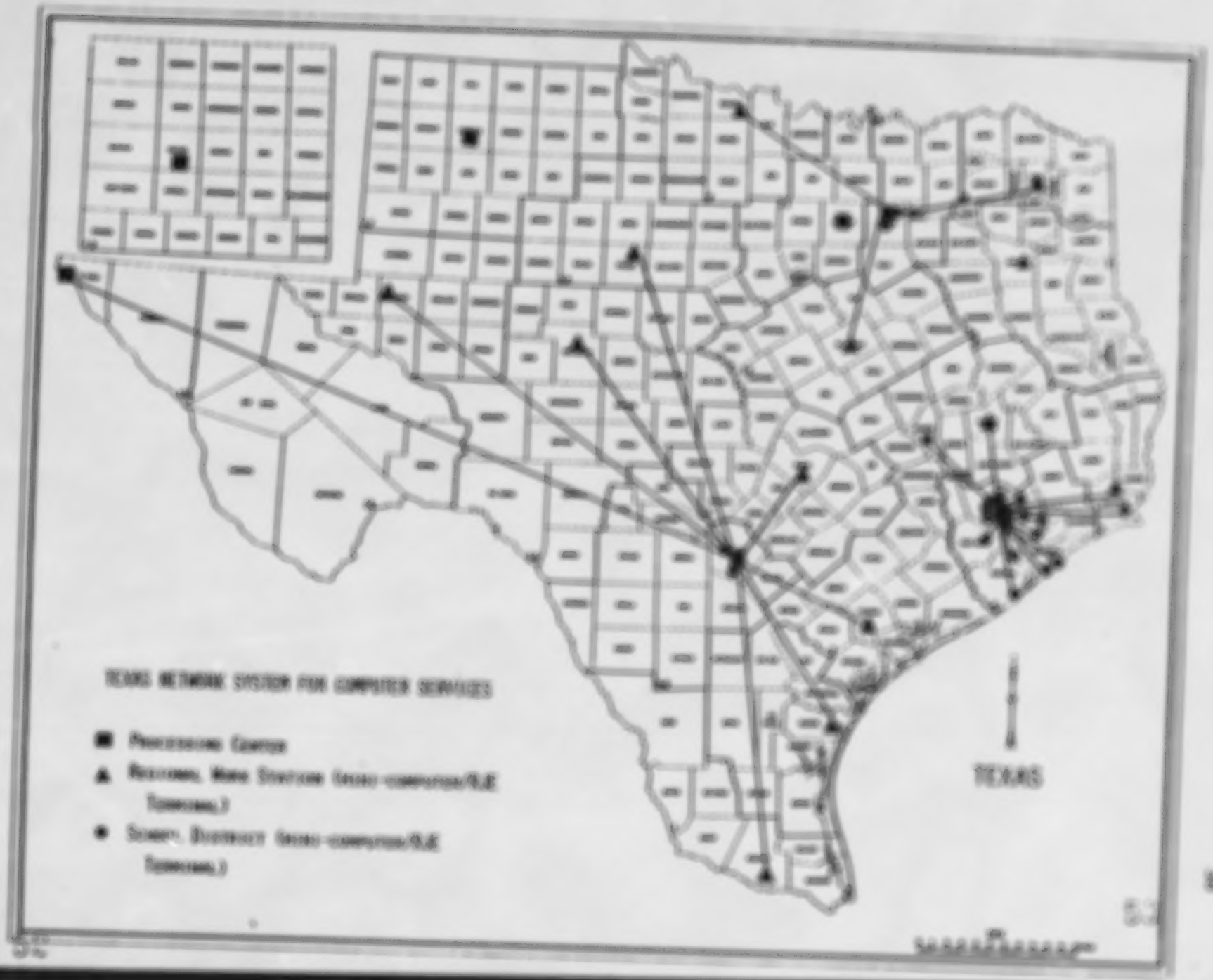
Since its inception, computer services for both instructional and administrative uses have demonstrated a high level of success in Texas. The following summary describes the extent of services now being utilized by more than 75 percent of the districts in Texas (representing more than 90 percent of the students):

- . Class scheduling: 700,000 students.
- . Attendance accounting: 1,150,000 students.
- . Grade reporting: 650,000 students.
- . Test scoring: 950,000 standardized tests.
- . Payroll: 260,000 personnel.
- . Tax accounting: 190 school districts.

The map on the following page shows the locations of the computers used in the system. Computer hardware includes: 2 CDC CYBER 172-6, 4 IBM 370 series, and smaller computers such as Cincinnati Milacron, Hulett-Packard, Unitech, Data Point, and PDP/10 (some of which are dedicated), and approximately 70 minicomputer/remote job entry terminals in school districts. There are 1,700 interactive terminals for instructional and administrative uses on school campuses.

From the above description, it can be seen that the computer has achieved widespread use in Texas public school education. A statewide needs assessment of all school districts in Texas (1976) pointed to the need for lower-cost interactive services to serve all schools--particularly small and remote districts. Many of the school districts, serving a vast majority of the boys and girls, have highly utilitarian programs in operation. The TTSD envisions that use of the satellite will enhance the current system in several ways:

- . Reduction in costs that would come about as the result of a nonterrestrial interactive communications system.


TEXAS NETWORK SYSTEM FOR COMPUTER SERVICES
TEXAS

. . Economies resulting from increased compatability between hardware configurations (and actual reductions in hardware).

. . Ability to serve clients not now served.

Selected elements in the system described above will be incorporated into the TTSD during the third year of operation. Selection of those elements to be included will be determined to meet district requirements at that time, to assure minimal interruption of existing services, and to conform with policies established by the State Board of Education.

Texas Agricultural Extension Service, Texas A&M University System, College Station (TAEX)

Agency Description: The Texas Agricultural Extension Service is a state agency assigned to the Texas A & M University. It is funded from federal, state, and county sources, with offices and personnel serving 252 of the 254 Texas counties. The agency conducts educational programs across 78 different subject matter areas related to agriculture, home economics, youth development (4-H work), community resource development and related areas. This work is conducted by 1011 full-time professionals supported by 294 paraprofessionals and 291 clerical/support staff headquartered at county, district, and state level offices.

The professional staff members include 377 county extension agents in agriculture, 331 county extension agents in home economics, 198 subject matter specialists, and 109 specialists and staff assigned program development and administrative or coordinating functions.

Program needs are determined in each county through a formal Program Building Committee structured to represent the various clientele groups interested in the wide range of subject-oriented programs available to them through the Extension Service. These committees are structured to represent geographical, ethnic, racial and other related factors within the county and are assigned the responsibility of giving adequate guidance

to the professional extension staff to insure that programs are directed to the needs of the clientele groups within each county.

Each County Extension unit has developed a long-term plan of work designed to identify essential programming needs and background situation information. These plans are developed through the involvement of local citizens to help assure that annual plans of work designed by the county Program Building Committee and its various sub-committees are directed to long-term goals and objectives important to the citizens within the county.

County plans are reviewed at the district level, each district containing 11 to 22 counties. Through this process, the program support personnel representing the Area and State Extension specialists are integrated into the county program plans and are able to represent client needs as defined by the goals and objectives to be achieved.

The state-wide nature of the organization, the complex program development procedure through clientele involvement, the range of educational programs conducted and the organizational structure requires that all levels of staff be highly trained and continually up-dated in their respective subject matter areas. They must be able to use effective informal programming and teaching methods and procedures in developing and delivering useful educational programs and services to meet the expressed needs of their clients.

These needs are reflected in the following categories:

- . . Administrative communications designed to assist the entire staff in better understanding the organizational goals, operating policies, procedures and resources of the agency.
- . . Informal continuing education to update the staff in technical subject matters, program methods and procedures, and teaching methods.

. . Formal graduate courses designed to assist the professional staff pursue advanced degree programs which are strongly encouraged by the organization as part of their professional development plan. For example, in 1976 over 350 staff members were enrolled in graduate courses with 23 receiving advanced degrees. Each staff member is required to file an individual professional development plan setting specific goals within the guidelines provided by the Extension Service.

Experiment #3: Comprehensive Staff Development

The objective of this experiment is to provide continuing education services for staff members in order to improve their professional competence and performance. Under the experiment, a series of 78 instructional television units will be transmitted by satellite for instruction of staff members. Initially, 10 out of 14 district offices in the state will be covered, with the remaining locations to be included during the second stage of the Demonstration.

Program areas will include agriculture, home economics, youth development, community development, program development, and teaching methods used in informal educational programs offered throughout the state. For subject matters related to agriculture, 377 county extension agents and subject matter specialists will be involved; for home economics, 331 county extension agents and subject matter specialists are included; for youth development, 500 county agents and subject matter specialists will receive inservice training; in community development, the program will reach 250 county extension agents. Improvement of teaching skills will involve about 1,000 county extension agents and subject matter specialists.

The comprehensive staff development program will provide a uniform quality of inservice training on a statewide basis. Such uniform service cannot be offered with existing technology. Utilization of the satellite will provide such a capability for the first time, and at a cost significantly less than that of alternative methods available to TAEX. A detailed cost-saving analysis was undertaken and is included in Appendix II, "Comprehensive Staff Development and Administrative Conferencing Project, TAEX." Cost savings are the direct result of reduced need for travel to attend central staff training meetings and of better utilization of limited personnel resources assigned to provide inservice training.

The development of program materials for inservice training will proceed with direct involvement of county extension staff through both interview and survey methods to determine more precisely the subject matter areas to be offered during the intensive inservice training program. Training needs will then be placed in priority order and individual instructors will be selected for each instructional unit. Instructors will receive training on how to teach effectively via television with two-way audio capabilities.

Each production unit will be 3½ hours long. Viewing schedules and locations will be announced to the county staff for each broadcast, and supplemental printed materials will be sent to each viewing location to be used by the viewing site coordinator.

It is planned to pretest early production units with representative audiences to determine audience response and to gain experience in improving the quality of future instructional units.

Evaluation procedures will be developed for pre-, during, and post-production evaluations. An immediate objective of evaluation is to

EXPERIMENT #3

PROJECT NAME: COMPREHENSIVE STAFF DEVELOPMENT
AGENCY NAME: TEXAS AGRICULTURAL EXTENSION SERVICE, TEXAS A & M UNIVERSITY SYSTEM

Goal

To improve overall professional staff performance through an extensive inservice staff development program

Projective Objective

To conduct a series of 78 instructional television units via the staellite system to professional staff at 10 or more sites to increase their knowledge in subject matter related to agriculture, home economics, community resource development, youth development, programming methods, and teaching procedures.

Important Assumptions

1. System will provide 1-way video and 2-way audio to and from 10 or more agricultural extension office sites.
2. Funds for extension service staff (in-kind Consortium) will be included in the 1979-81 budget request.

Expected Results	*Verifiable Indicators*	*Means of Verification*
1. A significantly improved staff performance.	1. Improved performance on post-trained tests.	1. Comparison of post training tests to participants in satellite demonstration with participants in conventional staff training.
2. Expanded staff training. Lower Cost per professional trained.	2. Improved educational and organizational activities at Extension Office.	

Expected Results	*Verifiable Indicators*	*Means of Verification*
		2. Instruments developed in Phase II.
	3. Lowered cost and increased quality with satellite instruction.	3. Comparison of cost and quality of satellite to conventional staff training.
	4. More uniform distribution of technical methods training to entering field staff.	
	5. More efficient development of personnel for trainers role.	

Activities

1. Assess priority training needs of the various staff positions.
2. Identify ITV instructions.
3. Up-grade TV production facility.
4. Identify production staff. Produce ITV instruction units.
5. Develop program management operations procedures.
6. Monitor and evaluate production

Activities

7. Monitor and evaluate production procedures.

8. Monitor and evaluate ITV effectiveness.

9. Monitor and evaluate operational procedures during scope of demonstration.

10. Identify sources of support for continuing the system after grant funds are withdrawn.

assure the maintenance of high quality production standards. Postviewing evaluation is designed to measure changes in knowledge levels and reactions to the quality of the instructional unit and method of instruction. Overall evaluation of the experiment will measure impact on the organization and its service delivery by analyzing the efficiency of resource utilization, the cost effectiveness of satellite operations, increase in audience reached, and responsiveness in program development to clients.

The production quality of each unit--such as software development, broadcast quality, viewing site management, scheduling and advance information--will be monitored and recorded on standard response forms adjusted for the experiment.

The inservice training program described is being supplemented by development of formal professional improvement programs which encourage personnel to obtain advanced degrees through liberal study leave policies. A total of 265 requests for graduate course study have been received for the 1977-78 program year. The potential of offering graduate courses related to the professional development needs of the professional staff via satellite will be explored during the Demonstration. If feasible, the offering of formal continuing education at the graduate level, approved for off-campus locations, would meet an individual as well as an organizational need with much less disruption in service delivery than under present arrangements.

See Appendix II for a needs assessment and program development model that is typical of the TTSD members.

Experiment #4: Administrative Conferencing

This experiment is designed to meet the needs of administrative staffs for more frequent, less time consuming and less costly interaction than

is possible with currently used methods. District agents in charge of the fourteen TAEX regions in the state have to travel throughout each month to conduct administrative/program development matters related to personnel recruitment, program and administrative policy, budgets, and a variety of related matters. Since many of the district agents travel long distances, both time and travel expenses are important considerations.

By using the satellite capability available to TTSD, bimonthly administrative teleconferences will be held. Conferences will be attended by administrative staff from all over the state. In general, two administrators from each of the fourteen districts will attend, as well as central staff located in College Station. Initially, link-ups with ten sites will be technically possible, with extension agents from sites not yet served travelling to the nearest district office. During the third and fourth year of Phase II (Phase II-B), coverage will be extended to all fourteen districts.

The administrative conferences will be scheduled for 1½ hours each. They will provide the extension system with a vehicle for immediate feedback from the field offices on matters which require field data or immediate exchange of information as a condition of decision making involving the central administrative staff. The conference network will provide several additional advantages: a confidential setting will allow for dealing with personnel and other internal matters; participants can reduce time lost in the decision process by immediate interaction capability; and visual material can be transmitted, since the system will allow for one-way video and two-way audio transmissions.

Agendas for the meetings will be prepared in advance by central staff and communicated to district offices. Districts will communicate agenda items they want to discuss ahead of time. In addition, special conferences can be scheduled at short notice in case of emergencies. Many statewide emergencies in the areas of animal health and natural disasters require the immediate response of county extension staff in rural areas. The ability to communicate statewide with district extension agents could result in effective action on the part of county staff with resulting savings in both human suffering and money.

Evaluations will consist of comparing the costs of satellite conferencing with the system currently used. Participants in the teleconferences will also be surveyed to assess the effectiveness of the teleconference medium for decision making and exchange of information.

TAEX has developed a detailed plan, including assessment of needs, statement of goals and objectives, and identification of expected results and activities, as well as information about budgetary and personnel requirements. This plan is included as Appendix II. It serves the function of providing additional information about experiments #3 and #4, as well as illustrating the kind of planning document which each of the Consortium members will prepare during the preoperational phase of the Demonstration.

TAEX also prepared an exploratory cost-benefit analysis for the two experiments it will conduct. The potential savings resulting from both experiments are estimated to amount to $150,000 - $200,000 when compared to other methods of offering an equivalent amount of inservice training and administrative communications as proposed in experiments #3 and #4.

EXPERIMENT #6

PROJECT NAME: ADMINISTRATIVE CONFERENCING
AGENCY NAME: TEXAS AGRICULTURAL EXTENSION SERVICE, TEXAS A & M UNIVERSITY SYSTEM

Goal

To improve overall organizational administration and management through more efficient flow of administrative communications

Projection Objective

To conduct a series of 78 administrative conferences via the satellite system to enhance the flow of administrative communication between the District Extension Agents at 12 sites and Central Administrative staff.

Important Assumptions

1. The system will provide one-way video, two-way audio to 12 sites where County Service office exist.

Expected Results	*Verifiable Indicators*	*Means of Verification*
1. Significant improvement of administrative communication.	1. Comparison of the effectness of administrative communication via satellite with the current system.	To be developed.
2. Lowered cost of administrative communication.	2. Comparison of the cost of administrative communication via satellite with the current system.	To be developed.

Expected Results	Verifiable Indicators	Means of Verification
	3. Comparison of time required to implement major organizational policy and operational decisions.	
	4. Comparison of efficiency of organizational policy and operations as applied by crisis management.	

Activities

1. Review the priority administrative coordination needs.
2. Develop operational procedures for the twice monthly administrative conference.
3. Develop agendas.
4. Monitor effectiveness & of transfer of information between crisis management and central administrative staff.
5. Evaluate cost effectiveness of satellite systems.

Texas Department of Mental Health and Mental Retardation, (MHMR) Medical Services Continuing Education at Texas Research Institute of Mental Sciences (TRIMS)

Agency Description: MHMR is a state agency responsible for the provision of quality care, treatment, and training to the mentally ill, the retarded, the developmentally disabled, and drug and alcohol abusers. Services are offered statewide through eight state hospitals, twelve state schools, twenty-eight MHMR centers, and over 500 affiliated community mental health agencies. The agency's total budget for 1977 amounts to $306 million. Funds are received from state and federal sources.

The Texas Research Institute of Mental Sciences (TRIMS), a part of MHMR, is responsible for research in mental health sciences and training of mental health professionals and paraprofessionals. The annual training budget exceeds one million dollars. Training activities are administered by the agency-wide department of Professional Services/ Continuing Education.

Experiment #5: Mental Health Care Continuing Education

The experiment consists of continuing education programs for mental health professionals in clinical, residential and research settings. Information will be presented in the form of seminars, symposia, conferences, and workshops. At the present time, continuing education activities use meetings at central locations, requiring travel on the part of participants. This results in reduced time with clients and patients. Travel costs, in both time and money, are significant. If program delivery is shifted to each facility, savings in money and time will result. In addition, increased participation in programs by staff can be expected.

The use of satellite transmission will provide a flexible, effective and convenient system for simultaneous program presentation to MHMR facilities throughout the state. The system will serve the needs of specialized audiences within the department. Five target groups need to be served: medical doctors, registered nurses, licensed vocational nurses, registered pharmacists, and social workers. Needs assessments for each target group have been completed. The following criteria were used: the current goals of MHMR, the frequency with which training topics are mentioned by respondents, the potential for reducing vulnerability of staff and agency to legal action, the degree of overlap of subject areas across professional disciplines, factors affecting safety of treatment, need for transition to maximum extent possible from institutional to community care. As a result of these assessments, prioritizing of tasks and long-range planning are currently underway.

A particularly important part of the needs assessment took the form of survey questionnaires distributed to the target audiences to determine what they perceived as their major continuing education needs. This was followed by personal interviews with a large sample of the practitioners in which they were asked to describe what they perceived as deficiencies in their knowledge, attitude and skills for their particular responsibilities and also what they perceived as deficiencies in their fellow practitioners and supportive disciplines. These inputs were further refined by matching them with survey reports from evaluations made by professional site-visit teams.

The principal finding of the needs assessment was that the chief areas of concern were in fundamental skills and sciences which were fairly discipline-specific. Accordingly the first phase of programming,

using conventional meeting arrangements, was addressed to the physician, nurse, and pharmacist practicing in a mental health system who had not had training for the care and treatment of the mentally ill. A first education program series was designed in collaboration with Baylor University and the University of Texas. In January 1977, the Advanced Psychiatric Series began. It will be offered for 24 months. Each unit is videotaped and packaged with a syllabus and training plan as an individual learning module. The Continuing Education department provides faculty and reference resources.

Programming for the satellite experiment will follow a similar format; however, it will be possible to reach a much larger group of professionals and paraprofessionals. It is planned to provide regular and routine training for 13,000 individuals, representing about 75 percent of the total MHMR staff at 16 facilities throughout the state. Since the agency's staff turnover rate is higher than 40 percent per year, the technical capability of reaching new staff without delay and on a regular basis is of utmost importance for the efficient operation of MHMR.

It is likely that some of the currently used program materials can be used as part of the satellite experiment, since it has been adapted for live video and interactive audio transmission. A significant part of the program material, however, will be produced specifically for the purposes of the satellite experiment.

Prior to program air time, advance materials will be distributed to all staff and notices describing the program will be circulated. Evaluation and learning materials will also be distributed just before air time. Currently used evaluation instruments will be revised to include user information concerning the specific qualities of the satellite-based

EXPERIMENT #5

PROJECT NAME: MENTAL HEALTH CARE CONTINUING EDUCATION
AGENCY NAME: TEXAS DEPARTMENT OF MENTAL HEALTH AND MENTAL RETARDATION, DEPARTMENT OF PROFESSIONAL SERVICES CONTINUING EDUCATION

Goal

To provide optimal treatment, rehabilitation, and education to clients and patients in TDMHMR facilities.

Projective Objective

To provide regular and routine training for 13,000 (approx. 75%) professionals and para-professionals at 16 TDMHMR facilities using satellite transmission.

Important Assumption

1. The new Commissioner will not alter the goals or structure of TDMHMR in a way which will affect this project
2. Confidentiality of program content can and will be preserved when necessary.
3. Funds for MHMR staff (consortium in-kind) will be appropriated by the 1979 Texas Legislature.

Expected Results	*Verifiable Indicators*	*Means of Verification*
1. More staff time spent at facilities with clients patients.	1. Fewer requests for travel patient records will indicate for staff-patient time.	1. Business office records; patient records.

Expected Results	*Verifiable Indicators*	*Means of Verification*
2. Increas in patient habilitation and rehabilitation rates	2. Reduced recidivation; patient behavior changes; reduced outpatient clinic visits.	2. Patient records; standard functional tests.
3. More professional and paraprofessional requests for continuing education.	3. Increased formal and informal feedback; more program queries, more consultations requested.	3. Memos/letters, objective assessments, evaluations, and verbal requests; questionnaires, interviews, self-response, number of consultations; rating scales.
4. Professional staff will accept telecommunication as a viable medium of instruction.	4. Program census; evaluation of satellite demonstration.	4. Polling instruments.

Activities

1. Convince facility administrators to participate.
2. Orient and train porgram facilitators at each site.
3. Conduct continual needs assessment for program content.
4. Arrange for program scheduling, equipment location, program promotion and support services.

Activities Cont.

5. Generate new programs based on current needs assessment.

6. Develop monitoring mechanisms.

7. Develop test and evaluation procedures for programs.

continuing education program, such as technical quality of transmission, convenience of air time, and effectiveness of local support systems.

Evaluation of the satellite experiment will include analysis of the number of participants, breakdown of audience by location, costs of producing and distributing materials, comparison of costs to present mail-delivered video cassette programs or centrally organized meetings, and travel and time costs of staff who must travel to a central distribution point to be able to follow the program.

In addition to an adoption of the pre- and posttests and "happiness index" tests to the TTSD transmission, the informal evaluations through comments, letters, and memos will be central in evaluating the delivery of continuing education via the TTSD System. Also, the continued expansion of the Program Audit Division into all disciplines will reveal not only needs which still must be met, but improvement in staff quality which may be tied to Continuing Education activities. On the following pages is a copy of instruments currently used for evaluation.

University of Texas Health Science Center at San Antonio (UTHSC)

Agency Description: The Health Science Center is one of twelve constituent institutions of the University of Texas System. The Center is heavily involved in continuing education in medicine, nursing, and other health fields. The Division of Educational Communications provides media production and distribution services in support of the instructional, research, and public information programs of the Health Science Center. The Office of Continuing Education operates the Teleconference Network of Texas, a two-way audio system providing continuing education to 62 hospitals, clinics, and laboratories. Bridging makes the program accessible to health care professionals in 30 additional hospitals in Oklahoma and Kansas. The network has been in operation since 1971 and has been growing constantly.

FIRST DAY

ASSESSMENT OF EDUCATIONAL PROGRAM

The objectives implied that both the faculty and the participants would work jointly to enhance the participants' knowledge and skills (abilities) concerning the study subject/s. For each of the criteria below, please place a check (✓) on the seven point scale the degree to which you think this program met your needs or accomplished the objectives.

Your response to this assessment will be anonymous so we ask that you please be honest and make your response as candid as possible. This will help ensure that future workshops will be useful and effective. Write directly on this sheet. Return to program director or address shown below.

1. The organization of the program was:	Poor						Excellent
	1	2	3	4	5	6	7
2. The objectives of the program were:	Vague						Clearly Evident
	1	2	3	4	5	6	7
3. The work of the faculty was:	Poor						Excellent
	1	2	3	4	5	6	7
4. The ideas and activities presented were:	Dull						Very interesting
	1	2	3	4	5	6	7
5. The scope (coverage) was:	Inadequate						Very adequate
	1	2	3	4	5	6	7
6. My attendance at this program should prove:	No benefit						Very beneficial
	1	2	3	4	5	6	7
7. Overall, I consider this program:	Poor						Excellent
	1	2	3	4	5	6	7

8. Do you feel a need for additional information about the topic? Yes [ ] No [ ]

9. The stronger features of the program were: _____

10. The weaker features were: _____

11. General Comments: _____

THANK YOU. Robert R. White, Director, Continuing Education Services
TDHEOB, P. O. Box 12668, Capitol Station, Austin, Texas 78711

C 76

FACULTY EVALUATION

12. _____ Poor 1 2 3 4 5 6 Excellent 7

Comments: _____

13. _____ Poor 1 2 3 4 5 6 Excellent 7

Comments: _____

14. _____ Poor 1 2 3 4 5 6 Excellent 7

Comments: _____

15. _____ Poor 1 2 3 4 5 6 Excellent 7

Comments: _____

16. _____ Poor 1 2 3 4 5 6 Excellent 7

Comments: _____

17. _____ Poor 1 2 3 4 5 6 Excellent 7

Comments: _____

18. _____ Poor 1 2 3 4 5 6 Excellent 7

Comments: _____

19. _____ Poor 1 2 3 4 5 6 Excellent 7

Comments: _____

20. _____ Poor 1 2 3 4 5 6 Excellent 7

Comments: _____

21. _____ Poor 1 2 3 4 5 6 Excellent 7

Comments: _____

Experiment #6: Continuing Education to Health Care Professionals

The experiment is designed to provide continuing education to health care professionals. Use of satellite transmission will expand the existing system which uses landlines and is limited to two-way audio programming. The experiment will permit transmission of video materials which are essential to upgrading the quality of educational programs intended for medical practitioners. It will also become possible to expand geographic coverage within Texas of the existing network.

The present continuing education system is broadcast via microwave and cable leased from Southwestern Bell. Quality of transmission and reception is good, but costs are high. Approximately forty hours of programming are offered each month. Specialized courses are prepared for physicians, nurses, and allied health personnel. Special programs for family practice residents have recently been developed.

Users receive programs in their own hospitals, clinics, or laboratories. The network serves large and small hospitals alike. Sixty-five percent of participating hospitals have less than one hundred beds. Many of the hospitals reached are located in small towns and serve rural areas. However, many remote areas cannot be reached via landlines.

The current system uses a four-wire dedicated voice grade circuit. Participating institutions are supplied a Darom Convener which resembles a small stereo speaker and a push-to-talk microphone. UTHSC is equipped for full video production and television transmission.

Under the satellite experiment, the landline system will be supplemented by satellite transmission to 26 sites. Four communities will have more than one downlink. Several programming modes will be tested and compared with the present network: (a) some programs will be transmitted over the satellite using the existing two-way audio approach;

(b) video programs will be developed which will allow for continuing education courses most effectively taught with visual materials. Video transmission, combined with two-way interactive audio, is planned for patient education and continuing education programs for emergency medical technicians; (c) UTHSC will develop bilingual continuing education for health care technicians in areas not covered by the existing network. In areas with high concentrations of Mexican-Americans, this service has great potential for improving access to health care; and (d) by using cable TV networks, it will become possible to send patient education programs directly into doctors' offices, dentists' offices, and clinics. Material distributed will be continually updated, and prerecorded by the doctor or clinic for viewing at the patient's convenience. Emergency medical technicians' training will benefit from the same approach.

The needs assessment for the proposed experiment has grown directly out of the existing teleconference program. Physicians practicing in the rural areas surrounding San Antonio initially requested continuing education services. Following a first assessment of needs, it was decided to use the conference call approach rather than to rely exclusively on the traditional organization of meetings and workshops in central locations. As the program expanded over the course of the years, participating physicians were asked annually to evaluate last year's programs and to suggest changes or additions for the following year. Approximately 500 physicians participated in the evaluations. A program Advisory Committee was created to review comments and suggestions. Since the programs were designed primarily for the practicing physician in the rural areas, continuous user feedback was of great importance. The program also had to be self-supporting. Thus, a hospital staff's continued participation in the program became a powerful indicator of

performance.

Satellite programming will be developed in response to the results of the continuing needs assessment and evaluation process, which will be continued throughout the Demonstration. Current evaluation materials will be used, including questionnaires, happiness indices, and immediate feedback from users at the end of each program. Evaluation of new programs will require additional evaluation techniques to account for the differences in transmission modes. It will be of particular importance to identify those areas of programming which can be adequately performed by using interactive audio only, and to assess all aspects related to video programming.

As in the case of the existing teleconference network, attention will be given to organizational site arrangements. Local coordinators will be trained specifically for the needs of the satellite demonstration. Coordinators will be involved in local program arrangements, distribution of program materials prior to air time, verification of viewer attendance, and processing of evaluation forms.

EXPERIMENT #6

PROJECT NAME: CONTINUING EDUCATION TO HEALTH CARE PROFESSIONALS
AGENCY NAME: THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER

Narrative Summary

Goal

To demonstrate the cost effectiveness of providing interactive continuing education to health care professionals in their own hospitals, clinics and laboratories.

Projective Objective

To compare the cost, quality of transmissions, and acceptance by users of satellite transmitted two-way audio, one-way video, and two-way audio to health care professionals at 26 sites in 16 cities with two-way audio at the remaining sites in the current system.

Expected Results

1. Lowered cost and/or increased quality of instruction with satellite delivery.

Verifiable Indicators

1. Comparison of unit cost and unit benefit of satellite delivery--both one-way video and two-way audio--with landline delivery of two-way audio.

Means of Verification

1 & 2. Cost benefit using surveys and questionnaires to compare actual costs, audience happiness, adapting index already in use.

Important Assumptions

1. Availability of CATV access.
2. All programming will eventually via one delivery system.
3. Each satellite test site will be shared by at least one other member.
4. UTHSC will be able to access Grid for uplink capability.
5. The system will be self-supporting from subscriber revenue, requiring no additional funding from UTHSC.

American Technological University, American Education Complex (AEC)

Agency Description: The American Education Complex is made up of a number of independently administered institutions with extensive experience in the development of educational programs and delivery systems. The American Technological University is one of its institutional components, and its Energy Management Sciences Department will be responsible for the satellite experiment outlined below.

Experiment #7: Solar Energy Public Awareness Project

The experiment is designed to increase the knowledge of five selected public audiences about appropriate uses of solar energy as an alternative energy source. The information transmitted as part of the experiment will be presented in the general context of the energy crisis and the need for developing effective energy conservation measures. Specifically, the program will disseminate the most up-to-date information available concerning the economics of passive and active solar heating and cooling systems, and the effects on home construction and operation.

The needs assessment is based on the fact that public awareness of the energy crisis has been generally limited to exhortations to manipulate thermostats in the home and to drive more slowly. A wealth of technical and economic data for home owners, architects, and builders is available. These data must be located and digested before the economics of applying sound construction techniques and the benefits of solar-assisted devices can be understood and applied. There has been little public response.

For purposes of the Demonstration, it is assumed that the audience must be segmented into several categories:

1. Owners of existing structures, to whom the concept of retrofit must be proven economical;

2. Architects who must understand the benefits to clients and who must "sell" the sometimes added expenses of what are perceived to be unconventional approaches to building design;

3. Builders who must understand the reasons and techniques for building energy-conserving structures;

4. Installers of solar-assist systems; and

5. Educators, on whom fall the burdens of raising the level of awareness of the next generation of home owners and of providing a fundamental understanding of the economics of energy use and the application of alternative energy sources.

There are, of course, many other groups whose needs should, and could, be addressed. Selection of these five audiences, however, will provide a basis for a series of educational experiments to allow the design of five interrelated efforts covering the same fundamental elements. It can be seen that basic educational materials development will allow significant cost savings as the five packages are generated. Architects, for instance, will require additional materials addressing their particular viewpoints. Solar-assist systems installers must understand the specifications to which these systems must be installed and used and the pitfalls of improper installation.

During the survey portions of these proposed educational programs, participation on the part of the groups to which these educational units are being directed will be encouraged. Their levels of awareness will be determined, as well as their requirements for increased learning.

The home owner is obviously the largest single segment at which educational units must be directed. It is planned that programs aimed at this audience will be developed for viewing in the home. Many solar systems, and other installations related to energy conservation, are being installed on a retrofit basis in existing homes. Increasingly, new homes are being constructed with the goal of energy conservation having paramount importance. Surveys of home owners who have had solar systems

installed are being conducted in various locations in the United States. Results of these surveys are to be obtained and analyzed, and summaries of these consumer surveys will be developed. Materials prepared from these summaries will be used in the preparation of programming for home owners' use of solar energy.

The educational instructors, as well as architects, builders, and installers, will be taught in central locations most suitable for the purposes intended. During the survey segment of the experiment, these locations will be selected in order to achieve maximum participation. It is expected that requirements will vary for the different viewer groups and participation on the part of the planning groups is essential.

Program planning procedures of educational units to be offered will be developed in conjunction with both the intended audience groups and the funding agencies. This process will be conducted through the planning groups developed during the initial survey stage and the project coordinator, and will include the use of advisory committees from each audience category.

Home viewing and seminars will not occur until after the first twenty-two months of the project. During this time period, the following activities will be undertaken:

- Selection of audiences, materials, and guest lecturers;
- Location of funding sources;
- Development of initial instructional television units;
- Development of survey materials;
- Development of program schedules; and
- Establishment of workshops in which the selected advisory groups will have an opportunity to help plan the program and define their needs.

The effectiveness of the project will be directly related to the responsiveness of both the home viewing audience and the architects, builders, installers, and educators participating in the effort. A public information campaign will be developed and budgeted, and the materials produced will be sent to those individuals on current mailing lists in these four speciality areas. The home viewing audience will, of necessity, be reached through television public service announcements describing the project and inviting participation.

To check the effectiveness of this program, questionnaires will be made available to the audiences. Appropriately designed guidelines will accompany these questionnaires. Periodic analyses will be made of the responses.

At about the 31st month, an interim report describing the work done to date and the results achieved will be prepared. Near the end of the four years, a detailed questionnaire will be developed to be used in a survey of the home owners and seminar group participants. These survey materials will be reviewed first with the advisory groups for adequacy and completeness of coverage. Subsequent to their input, a sampling of home viewers and individual seminar participants surveys will be examined. Conclusions and recommendations will be collected and a determination of the effectiveness of the programming, content, advertising techniques, methodology, budget, and technical approach will be made. A final report will be prepared which will evaluate the entire program and make recommendations for follow-on activities.

EXPERIMENT #7

PROJECT NAME: SOLAR ENERGY PUBLIC AWARENESS PROJECT
AGENCY NAME: AMERICAN TECHNOLOGICAL UNIVERSITY, AMERICAN EDUCATION COMPLEX

Goal

To develop an understanding among selected segments of public audiences of the appropriate use of solar energy as an alternative energy source.

Projective Objective

To demonstrate the feasibility of using the hybrid communications network to inform five selected segments of the public audience of the appropriate uses of solar energy as an alternative energy source. The five selected audiences are:
- owners of existing homes,
- architects,
- builders,
- installers, and
- continuing & technical/ vocational educators.

Important Assumptions

1. Funding for production costs can be developed.
2. The public audience can be segmented logically into five categories.
3. Advisory Committees to guide program development and evaluation can be constituted.
4. Classes can be assembled in each of the five audience categories.

Expected Results	*Verifiable Indicators*	*Means of Verification*
1. Increased knowledge concerning appropriate use of solar energy as an alternate energy source among members of each of the five public audience categories.	- Number of instructional contact hours with consumers. - Number of persons who indicate they intend to try conversion to solar energy and/or plan to attempt solar energy education.	- User surveys. - User questionnaires.
2. Acceptance of hybrid communication network as an education tool for continuing technical and vocational education courses.	- Responses on user surveys and questionnaires.	
3. Gain experience with distribution of educational services at home level.		

Activities

1. Contact persons from each of the 5 user audiences to advise in development of programming and evaluation for experiment.

2. To develop and distribute resource lists of audio visual materials available or planned for availability to the public.

3. To determine the availability of professional guest lectures from pertinent government agencies, associations, universities under government funded contracts, and National Heating and Cooling Information Center.

Activities Cont.

4. To perform preliminary analyses of the levels of understnading of various segments of the viewing audiences.

5. To develop, as required instructional television units designed to provide information where none presently exists in a form suitable for this project.

6. To conduct seminars on a regularly scheduled basis, aimed at increasing the audience awareness of the economics of energy conservation and the use of alternative energy sources.

7. Pretest communication netwo.k and programming.

8. Evaluate the success of the experiment.

B. Consortium

The operational plan for the TTSD Consortium as a whole as opposed to individual members agendes, is summarized in the attached Pert and Framework charts. Details need not be repeated here. In general, the operational plan for he Consortium is subdivided in six levels, all of which will be developed concurrently:

- Policy development and oversight;
- User and citizen participation;
- System engineering;
- Administration and fiscal management;
- Evaluation and research; and
- System Operations

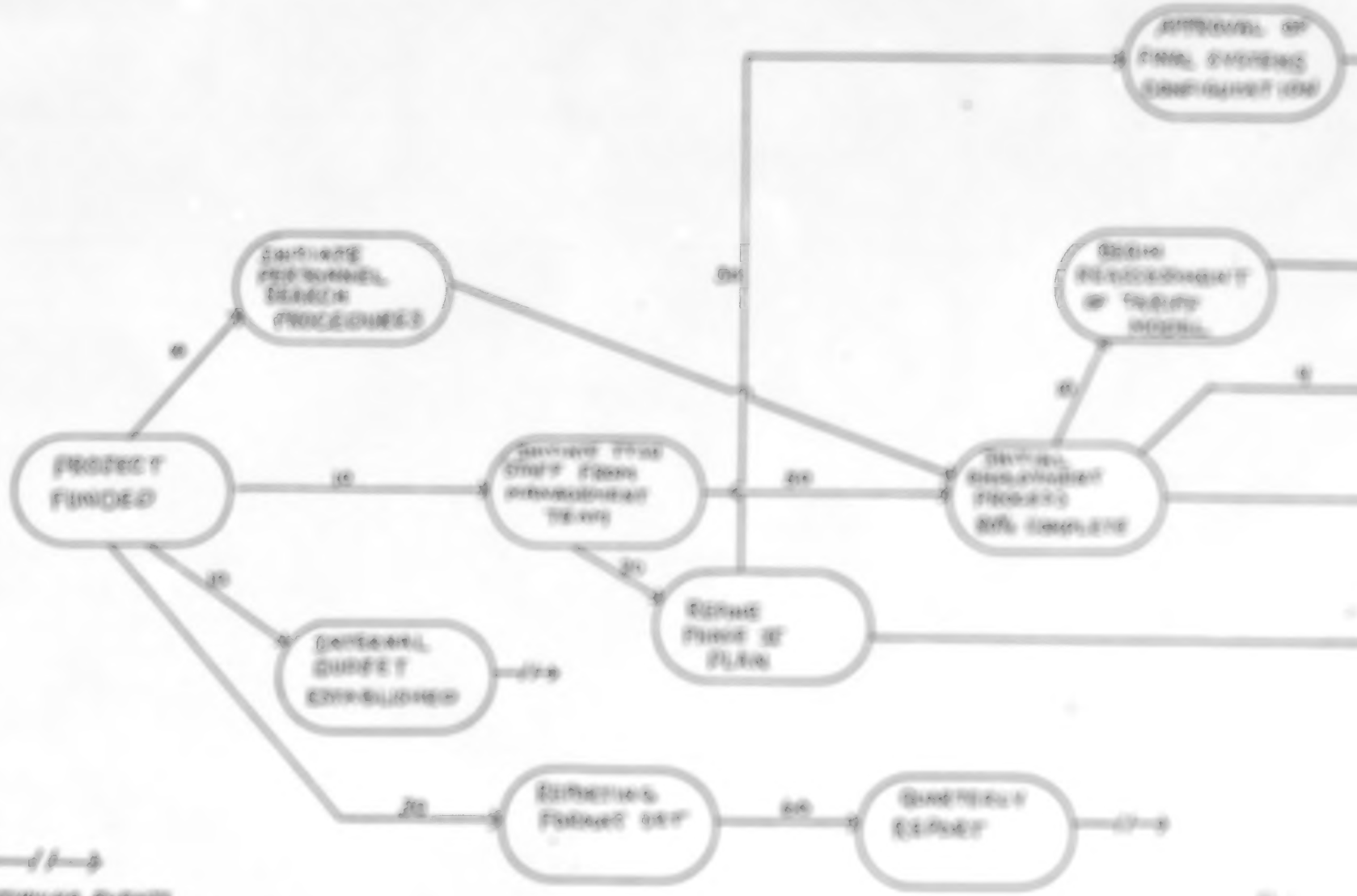
Policy Development and Oversight. Upon unding of the proposal, Region IV Education Service Center will be established as fiscal agent for the Demonstration during its first wo years. The present Advisory Council will nominate initial membership of the Coordinating Committee. Under the guidance of the Coordinting Committee, a statewide needs assessment for educational communication services will be conducted during the first year of the Demonstration. This will provide a basis for expanding size and membership of he Consortium. It will also provide essential information in planning the future organizational structure of TTSD. It is currently planned tht at the end of two years the functions of the fiscal agent will be tranferred to TTSD, which at this time will become an independent legal ntity. Planning will then concentrate on developing a permanent structur for TTSD following the Demonstration.

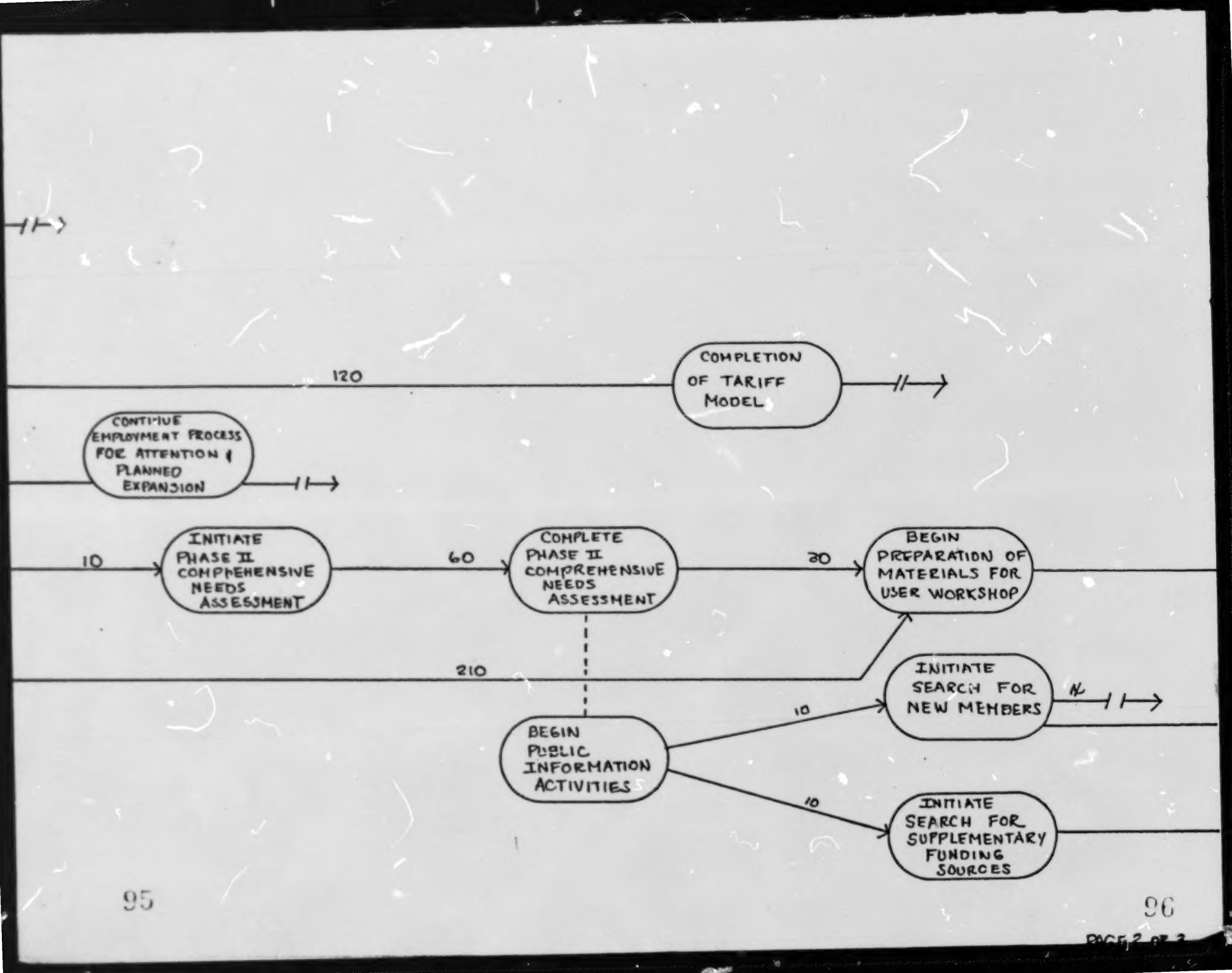
User and Citizen Participation. User participation will be organized immediately upon the Demonstration becoming operational. Each

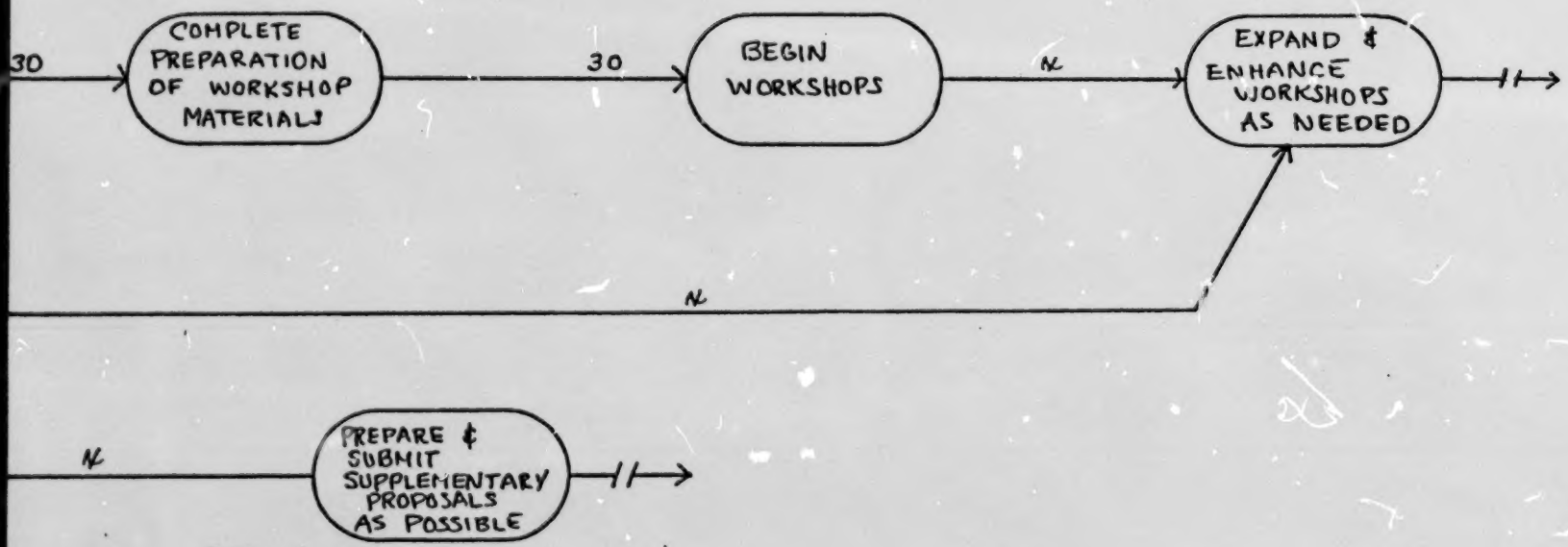
participating agency will activate advisory mechanisms for its experiments, designed to provide maximum interaction between users and program staff during planning, implementation, and evaluation of experiments. Each agency will convene a Users Advisory Committee (either an entirely new group or a committee used for other activities at the present time) and prepare a citizen participation plan which will outline details of membership and functions of the committee. At the Consortium level, a central Users Advisory Committee will be established. Membership will be from nominations by Consortium members and at-large members nominated by the Coordinating Committee. Reflecting the primary program mode of TTSD experiments, membership will initially be mostly from agency staff who are the intended recipients of the programs. As direct public programming is developed, increased membership will be sought from minorities, handicapped persons, consumers, educational, and other nonprofit and public interest groups. The Users Advisory Committee will be responsible for conducting a series of 24 regional meetings during a one-year period to solicit grass roots citizen input into the TTSD planning process.* The regional meetings will be carefully evaluated for use in the evolution of TTSD.

System Engineering. The proposed hybrid system, integrating satellite utilization with microwave and cable television networks, requires a high-level technical capability of TTSD. Technical staff will be hired immediately upon funding and a Technical Committee will be established to review and monitor system specifications. Staff and Technical Committee will develop final systems configurations and award bids for hardware purchase and installation to turn-key contractors.

*A preliminary proposal for a series of regional user meetings has been submitted to the National Science Foundation's Science and Citizen's Program.




120
COMPLETION OF TARIFF MODEL
CONTINUE EMPLOYMENT PROCESS FOR ATTENTION & PLANNED EXPANSION
10
INITIATE PHASE II COMPREHENSIVE NEEDS ASSESSMENT
60
COMPLETE PHASE II COMPREHENSIVE NEEDS ASSESSMENT
30
BEGIN PREPARATION OF MATERIALS FOR USER WORKSHOP
210
INITIATE SEARCH FOR NEW MEMBERS
NL
10
BEGIN PUBLIC INFORMATION ACTIVITIES
10
INITIATE SEARCH FOR SUPPLEMENTARY FUNDING SOURCES


30
COMPLETE PREPARATION OF WORKSHOP MATERIALS
30
BEGIN WORKSHOPS
NL
EXPAND & ENHANCE WORKSHOPS AS NEEDED
NL
NL
PREPARE & SUBMIT SUPPLEMENTARY PROPOSALS AS POSSIBLE

97

98

This will be followed by the development of a systems test plan and actual testing with a target date for the system to become operational 540 days after the initial funding of TTSD. Technical activities will be monitored by the fiscal agent and the Coordinating Committee.

Administration and Fiscal Management. The management and fiscal staff of TTSD will be appointed immediately upon funding, with the fiscal agent appointing the director who will then select the remaining staff. A detailed operational plan for Phase II-A of TTSD will be prepared as one of the first tasks. A precise division of labor will be worked out between the fiscal agent and the TTSD staff. Another task to be addressed early concerns the development of additional funding sources in order to meet requirements for declining NIE funding over the duration of the Demonstration. After completion of the organizing phase (first six months), development of the tariff model will be undertaken. Continuing tasks include development of a fiscal control system and budget planning, oversight of all parts of the organization, and provision of services to the Coordinating Committee and the Users Advisory Committee.

Evaluation and Research. A small evaluation and research team will be established as a separate unit of the TTSD staff. The group will be responsible for the conduct of internal formative and summative evaluations and will monitor evaluations by Consortium members. At the end of the first year, and then in yearly intervals, the evaluation group will submit a detailed report to the Coordinating Committee and User Advisory Committee summarizing agency evaluations and presenting an overall assessment of the various experiments and TTSD operations.

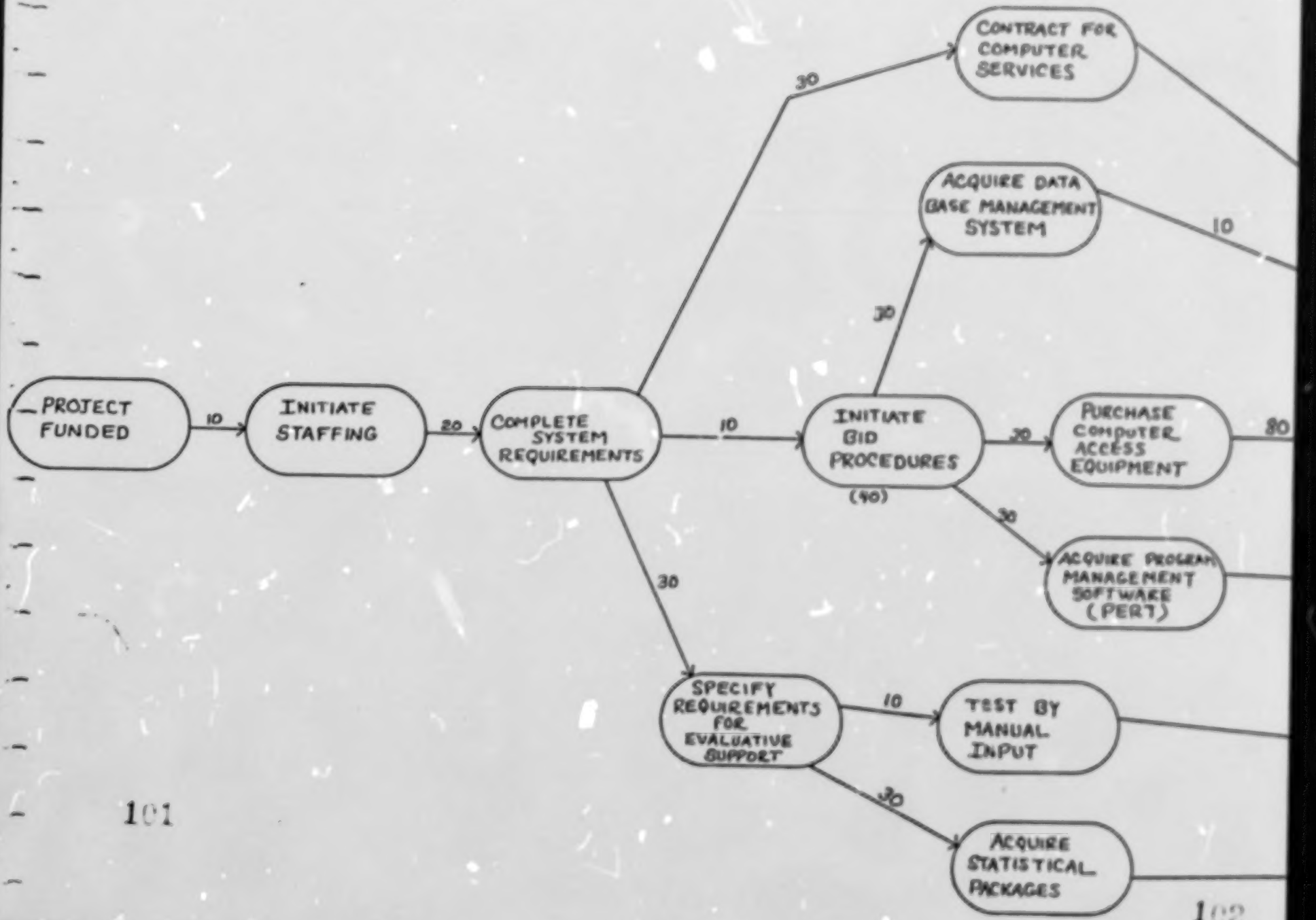
(See following page for PERT diagram.)

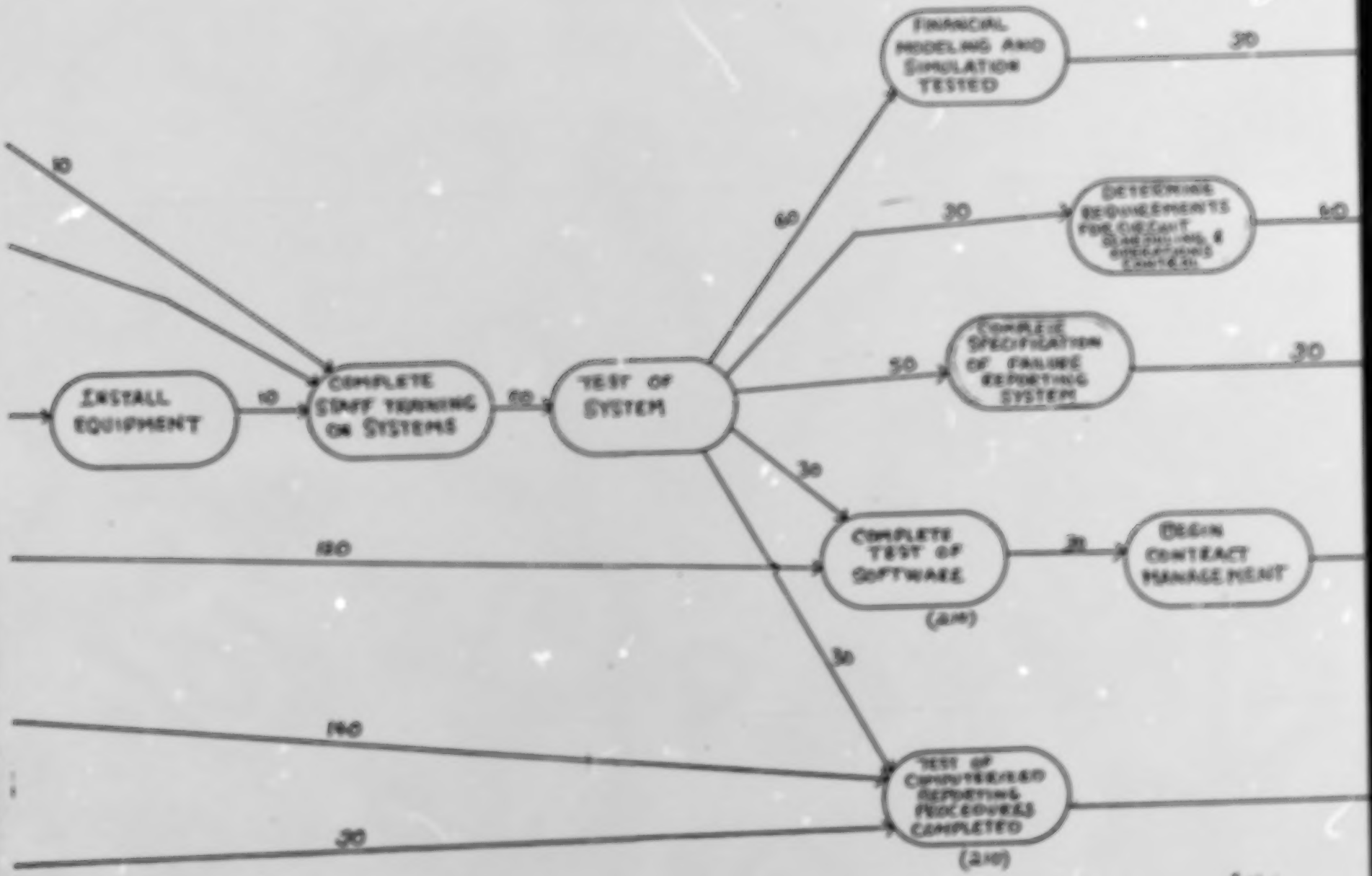
Evaluation status reports will be prepared at quarterly intervals. Work on a statewide needs assessment will be initiated after the first six months and completed by the end of the year.

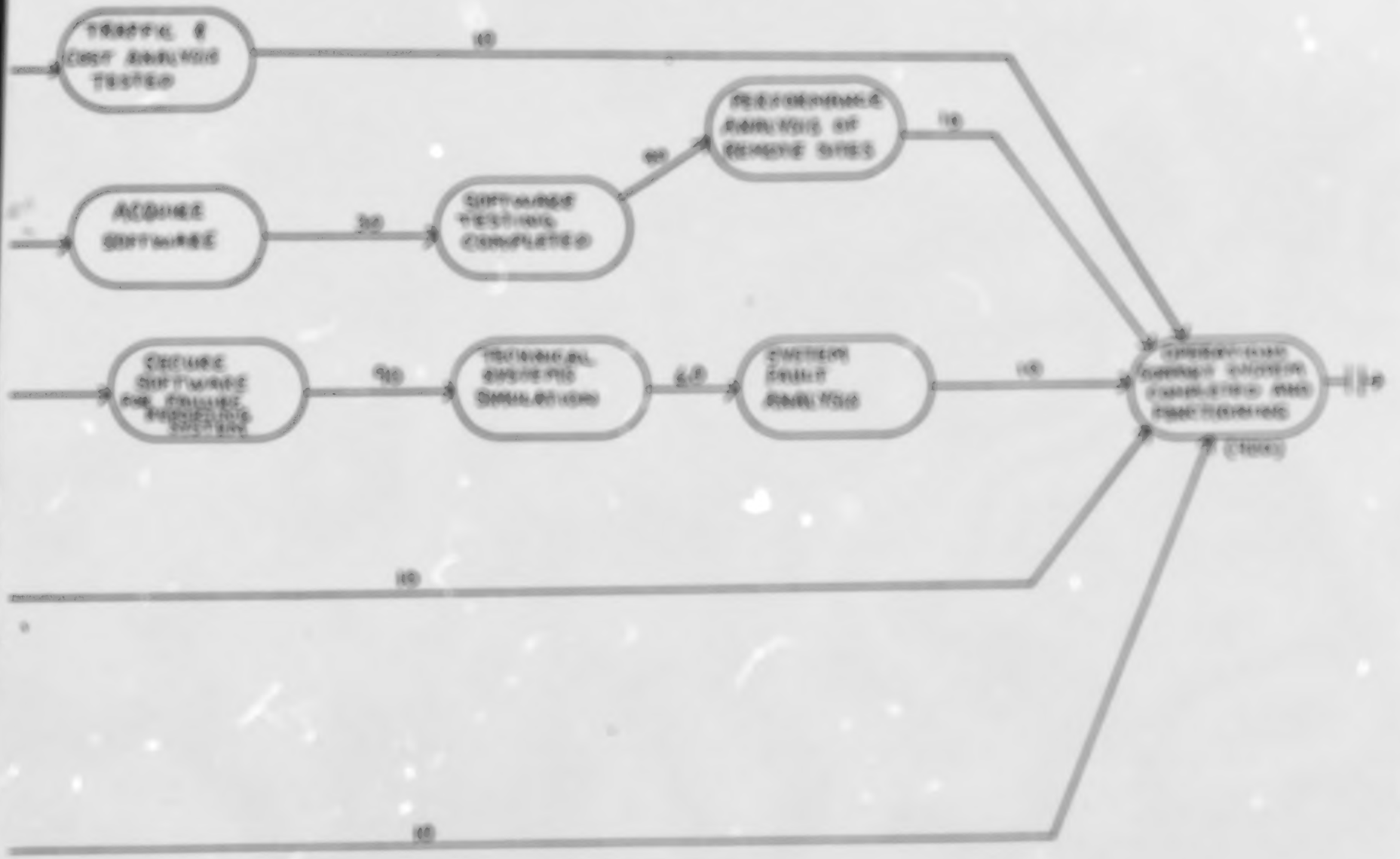
Yearly, comprehensive evaluations of agency experiments will be structured in such a way that control comparisons are possible. In particular, various delivery modes of existing educational services will be compared to the satellite mode of transmission. The network's value in meeting the identified user needs will be assessed.

During year three of the Demonstration, a summative internal evaluation of all experiments and of Consortium operations will be conducted. Simultaneously, a comprehensive external evaluation will be commissioned. Both evaluations should develop recommendations concerning the future evaluation of TTSD.

Systems Operations. Management and operational tasks will be assisted by a modern data management system. In addition to the obvious services to be performed by this unit--payroll, accounting, inventory control--it is planned to develop software for program management, program scheduling and operations control, tariff development and financial cost analyses. A failure reporting system will be developed and should be available as part of a system fault analysis capability. The system will also incorporate support functions for the evaluation and research. (See following page for PERT diagram.)


PROJECT FUNDED
10
INITIATE STAFFING
20
COMPLETE SYSTEM REQUIREMENTS
30
CONTRACT FOR COMPUTER SERVICES
30
ACQUIRE DATA BASE MANAGEMENT SYSTEM
10
10
INITIATE BID PROCEDURES
(40)
30
PURCHASE COMPUTER ACCESS EQUIPMENT
80
30
ACQUIRE PROGRAM MANAGEMENT SOFTWARE (PERT)
30
SPECIFY REQUIREMENTS FOR EVALUATIVE SUPPORT
10
TEST BY MANUAL INPUT
30
ACQUIRE STATISTICAL PACKAGES


INSTALL EQUIPMENT
10
COMPLETE STAFF TRAINING ON SYSTEMS
10
TEST OF SYSTEM
60
FINANCIAL MODELING AND SIMULATION TESTED
30
30
DETERMINE REQUIREMENTS FOR CURRENT
60
30
COMPLETE SPECIFICATION OF FAILURE REPORTING SYSTEM
30
30
COMPLETE TEST OF SOFTWARE
(20)
30
BEGIN CONTRACT MANAGEMENT
180
30
TEST OF COMPUTERIZED REPORTING PROCEDURES COMPLETED
(210)
140
30



CONSORTIUM FRAMEWORK

Goal

The primary goal of the state-wide satellite demonstration is to install, operate, and evaluate a comprehensive communication service delivery system which will provide the citizens of the State with greater opportunity for equal access to education and information.

Objective

To develop and demonstrate the feasibility of a hybrid communication network which will

- be installed and operated on a cost-effective basis;
- involve service providers and clients in the development, operation, and evaluation of educational services;
- provide agencies in the State with experience in the development of program materials and services designed to meet the needs of those areas and populations not now served by adequate telecommunication service; and
- extend and coordinate educational in-service and administrative services offered by State agencies.

Important Assumptions

1. NIE will continue funding project through year four.
2. Other fund sources will be developed within state and federal governments.
3. Hardware, software, and satellite distribution costs will continue to decline.
4. Cable operators will continue their cooperation.
5. Cost-effectiveness projections will attract new members allowing the leasing of a full transponder by the fifth year.
6. FCC applications will be approved for modification of existing dishes and the installation of additional dishes.
7. The organization will make the transition from ESC IV as fiscal agent to a permanent state organization.

Expected Results	*Verifiable Indicators*	*Means of Verification*
1. Experimenters will be able to:	- Cost per site and/or user.	- Cost benefit analysis
- provide the services currently provided at a lower cost;	- Effectiveness of hybird network delivery as outlined in evaluation section.	
- provide the same services more effectively for the same or slightly increased cost; and	- Increase in the number of users, number of sites, and total number of transmission hours.	- TTSD records
- expand services delivered and/or clients reached at the same of slightly lowered cost per client.	- Increase in post-test scores.	- Post tests
	- Increased satisfaction with administrative decision making.	- Opinion questionnaires
2. Improvement of quality of educational and administrative communication within experimenter organizations.	- High scores on user acceptance tests.	- Happiness indices; opinion questionnaires
3. User acceptance of hybrid communication network as a mode of educational and administrative communication.	- Technical test	- Technical test reports.
4. Hybrid communication network will opperate at 99.5% realiability.		

Activities

1. Hire all initial staff.

2. Appoint members of user advisory committee and the Coordinating Committee.

3. Develop the operations system--scheduling, tariffs, etc.

Activities Cont.

4. Develop the evaluation system.

5. Acquire and install technical equipment.

6. Begin satellite Hybrid Communications Network Operation.

7. Do annual evaluations of each experiement.

8. Do biannual status report of TTSD operations, technology and evaluation procedures.

9. Develop an annual evaluation summary of Hybird Communications Network operations, technology, and evaluation.

10. Hire outside evaluators.

11. Perform statewide needs assessment.

12. Determine the alternatives for continued operation of Hybrid Communications Network

C. Technical Systems Requirements

The Texas Telecommunications Satellite Demonstration System (TTSD) will be a cost-effective, hybrid, wideband communications system consisting of commercial domestic satellites, shared cablevision, receive-only earth terminals (ROTV), community cablevision systems, existing and expanded, closed-circuit television terrestrial microwave systems, multipoint distribution microwave systems, and educational television broadcast stations. The system will initially serve 21 rural and urban community areas when the system starts operation. Immediate expansion plans include 16 additional community areas and the addition of five TTSD owned uplink terminals. The initial system will have two TTSD owned or shared uplink terminals and will also utilize two common carrier uplink terminals. The initial system will satisfy 1-way video with 2-way audio requirements. As the system is expanded, more emphasis will be placed on narrowband utilization. The additional uplink capability will permit an orderly transition from existing terrestrial, common carrier, narrowband facilities to satellite distribution facilities.

In the initial engineering planning phase, it was decided that every effort would be made to use existing distribution systems, both commercial and TTSD consortium member owned, wherever practical. Investigations have revealed that Texas already has a large, untapped, available communications resource which can be used to hold the "last mile" costs to a minimum. This resource consists of over 250 community cablevision systems, for which some 50 applications have already been filed with the FCC for ROTV terminals. The bulk of these terminals will be operational before March 1979, and will use the same RCA domestic satellite, Satcom I. A survey of these CATV companies revealed that nearly all wanted to

participate in the project. Where channel capability existed, most companies were willing to make their facilities available to the project at no cost. All were willing to permit modifications to their systems, at TTSD project cost, where such modifications are necessary to accommodate TTSD requirements.

How to provide user member access to the satellite transponder at minimum cost was an important consideration. A major factor in this consideration is the coordination and clearance of transmit frequencies for an uplink. It was determined that the existing RCA earth terminal near Houston should be utilized in the initial system. A TTSD T/R terminal will be constructed near the center of an existing, closed-circuit educational terrestrial microwave system. This TTSD terminal will also have the capability of accessing the WESTAR satellite, as well as the RCA satellite, through an existing 10-meter, PBS network RO terminal. The WESTAR satellite may also be accessed through the Western Union R/T terminal at Cedar Hill, Texas through a cable connect from this same microwave system. A TTSD uplink will also be available to the RCA satellite through the facilities of a TAGER/Collins radio group facility presently in operation at Richardson. Through the limited expansion of the existing microwave facilities, the initial system will be served by four uplink originating sites.

The question of required Federal Communications Commission rulemaking was considered in the shared usage of satellite earth terminals by commercial entities, government entities, and nonprofit entities. Preliminary discussions with the Commission have indicated that such usage will be encouraged as it will provide maximum utilization of sites which had already been frequency-cleared, requiring continued frequency protection.

Consideration was also given to the possibility of using one-half of a transponder for closed-circuit video and the other half for single channel per carrier data or voice-grade circuits. Due to the power limitations in the transponder and the desire to use existing CATV ROTV 10-meter and 4.5-meter antennas, the carrier to noise ratio and figure of merit calculations indicated that required system performance parameters could not be met. Hence, the initial system will be primarily used to support sideband user requirements, with ongoing, narrowband experiments being conducted to allow for expansion of instructional and administrative services.

As the initial operating system is expanded, additional uplink terminals will be constructed in order to limit the interactive, terrestrial audio and video connections. Initially, these connections are required to cover sites within an area of 200 mile radius.

Existing CATV ROTV 10-meter antenna systems will be modified for transmit capability. As the narrowband requirements on the system grow, it is anticipated that the Federal Communications Commission will permit the use of low-power small aperture antennas to channel SCPC transmissions. If the approval is received, the CATV 4.5-meter antenna systems will be fed from 2-way cablevision systems for interactive data and voice circuits.

Common carrier interconnect fees also dictate that TTSD owned microwave and cable feeds to the uplink facilities and downlink users be provided in specific instances for cost effectiveness.

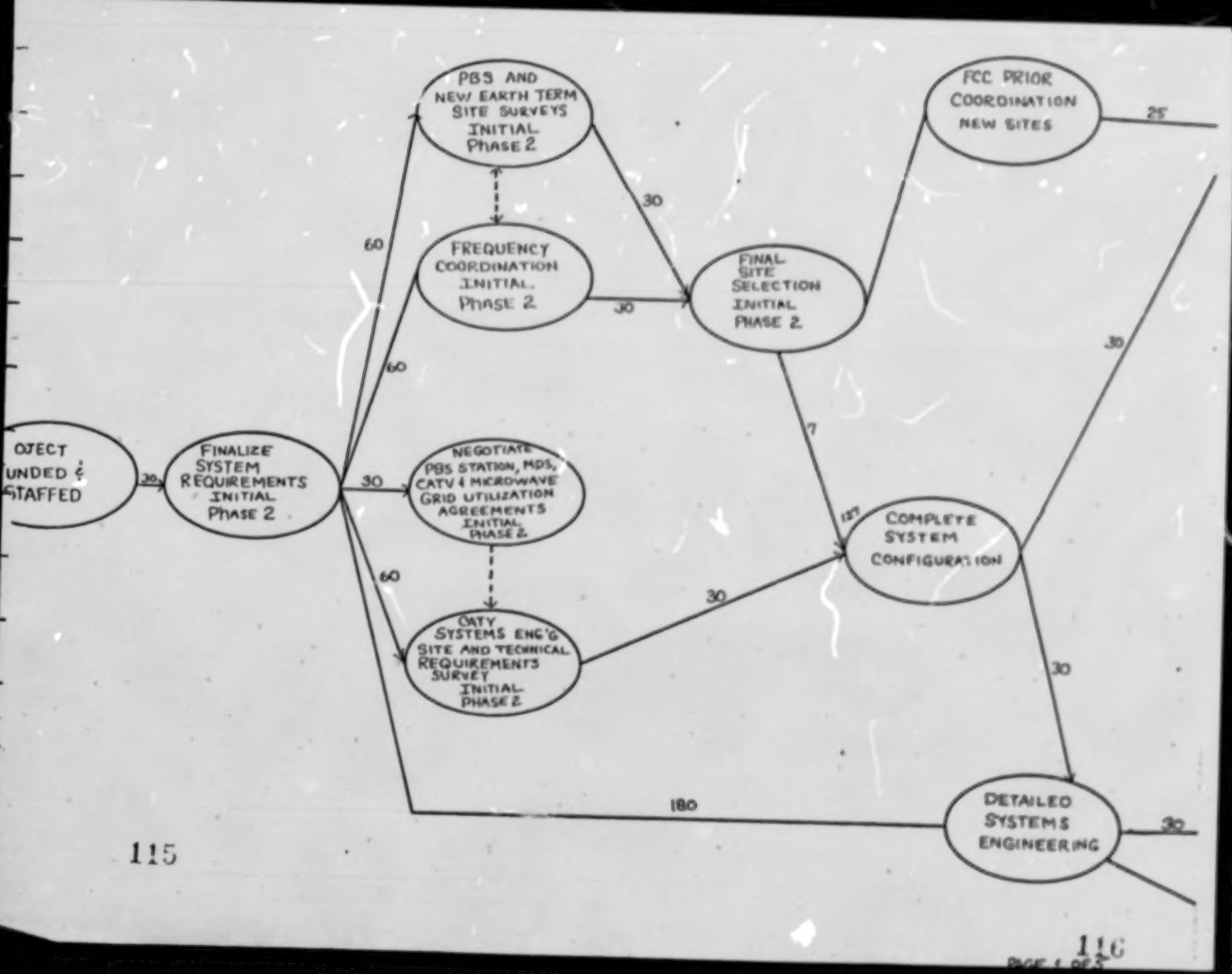
Where cable distribution systems are not available, commercial Multipoint Distribution and Instructional Television-Fixed Service microwave systems will be used to distribute the video signal to the ultimate user.

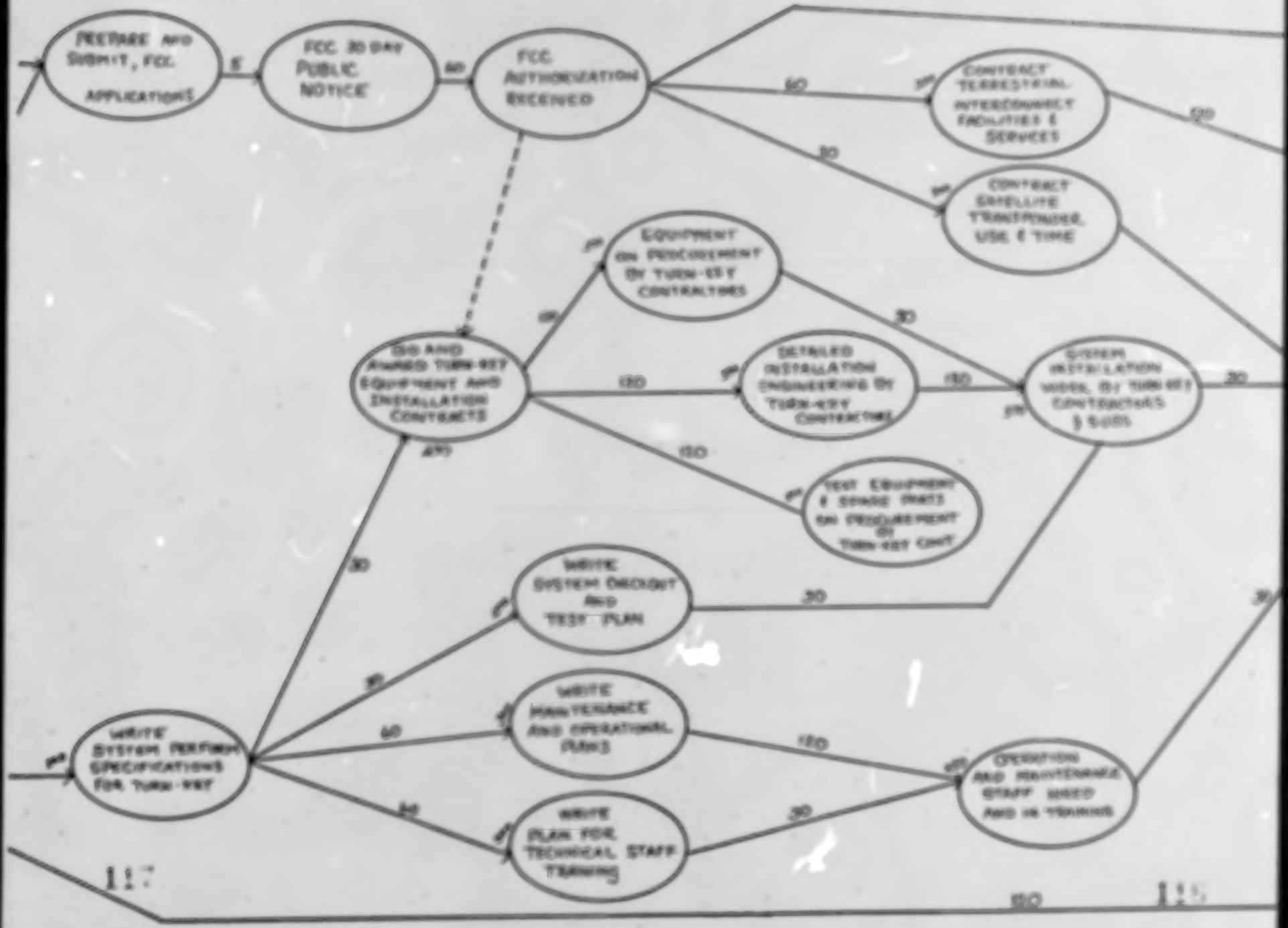
Texas presently has eight educational television stations affiliated with PBS. Seven of these stations have 10-meter dishes for receive only earth stations for network programming. The TTSD project will utilize these stations for instructional television distribution through the us of the station's existing space receiver, and through an additional purchased TTSD receiver. All programming received by the PBS stations will meet the PBS technical standards for rebroadcast. As the project progresses some of these PBS stations will be modified at TTSD cost for uplink capability to the WESTAR Satellite. Approval by each station involved and by CPB/PBS will be required and received before this portion of the project is implemented. (See next page for PERT.)

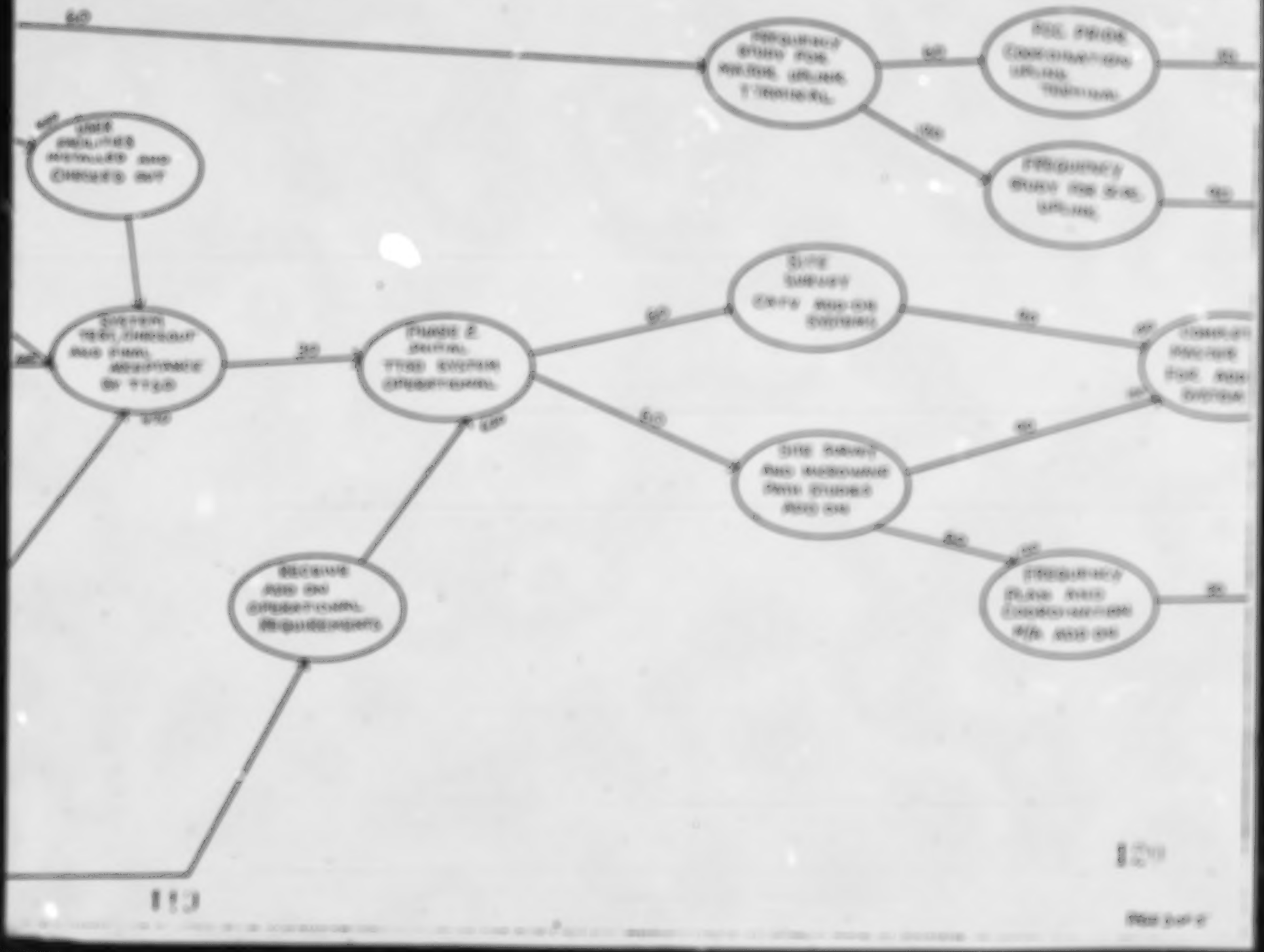
D. The Initial System

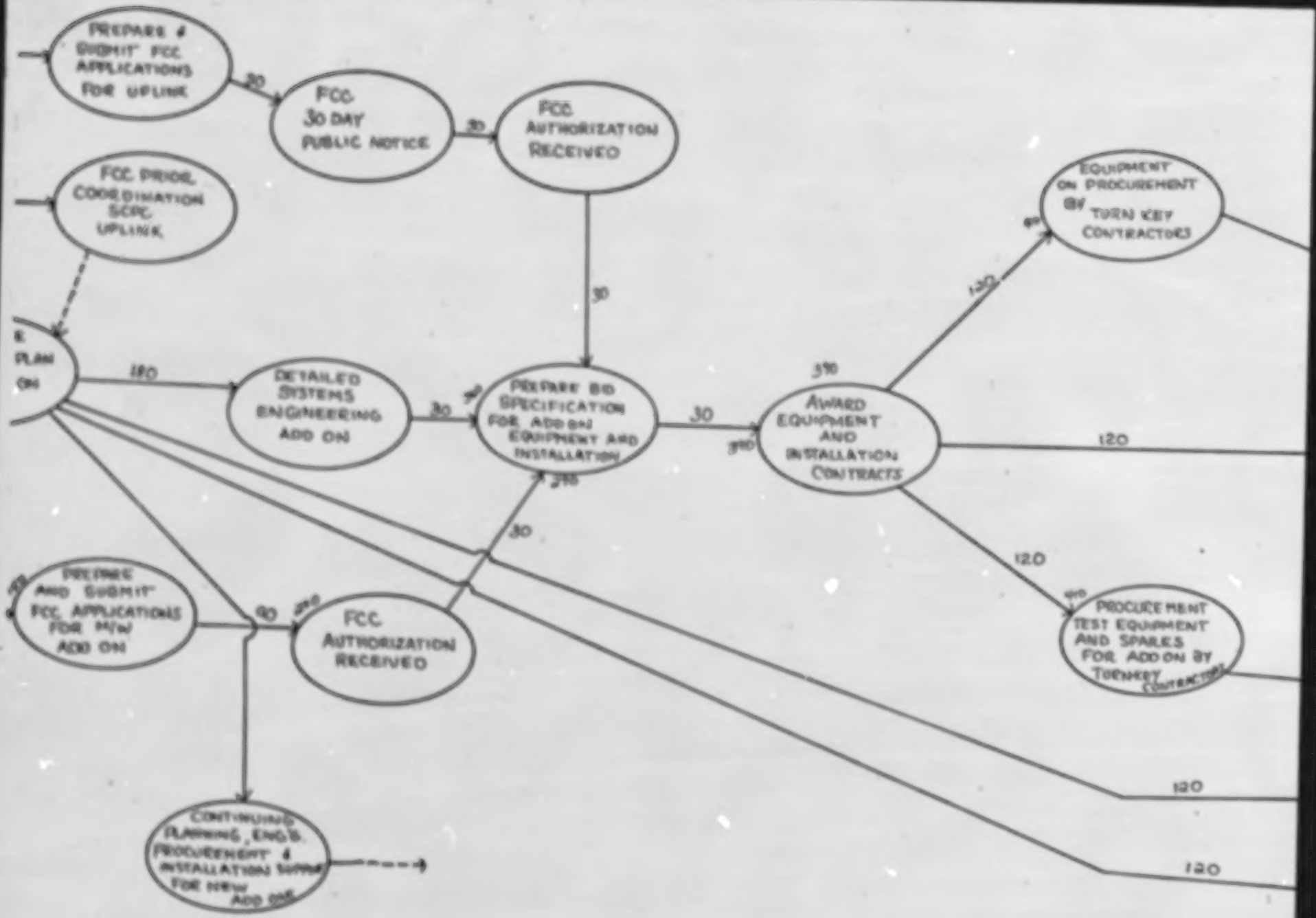
Satellite Transponder Access. The initial distribution system will have the capability to access two commercial satellites, RCA Satcom I and WESTAR I. The existing RCA transmit/receive earth terminal will be utilized from Houston by two members of the consortium. A TTSD transmit/receive terminal will be constructed at Killeen to access the RCA Satcom I satellite. See Appendix III for the hardware configurations, circuitry, and costs by site. This terminal will provide origination and receive capability for consortium members located at Ft. Worth, Dallas, Killeen, Temple, College Station, Austin, New Braunfels, and San Antonio. These members will also have access to the Western Union Transmit/Receive terminal at Dallas/Cedar Hill. Another uplink will be provided to the RCA satellite through an existing terminal located at the Collins Radio Group in Richardson. This unit will be connected by full-duplex microwave through TAGER to TTSD.

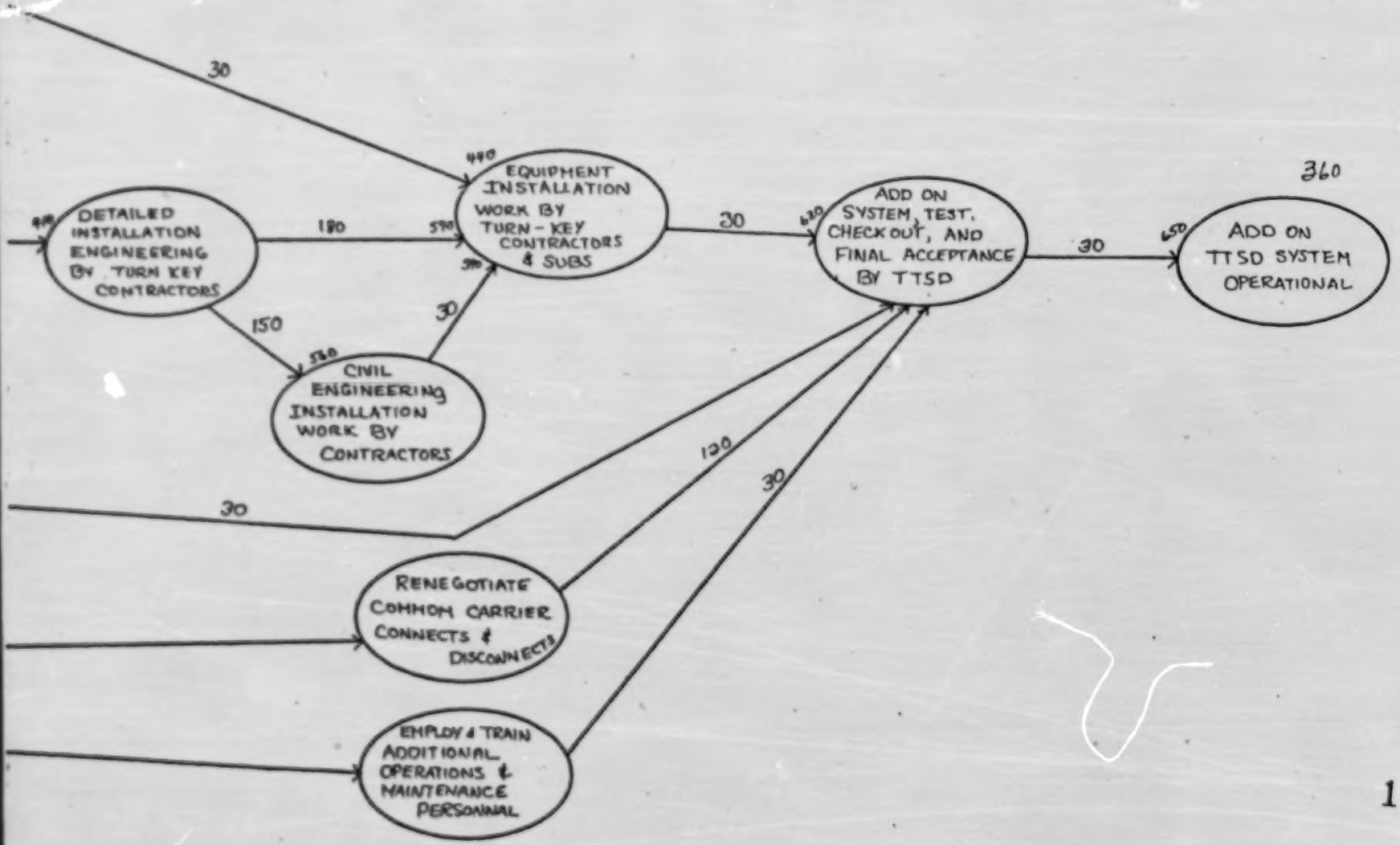
As the system expands, TTSD Transmit/Receive terminals will be added at or near Harlingen, El Paso, Lubbock, Houston, and Dallas. These


PBS AND NEW EARTH TERM SITE SURVEYS INITIAL PHASE 2
FCC PRIOR COORDINATION NEW SITES
25
30
FREQUENCY COORDINATION INITIAL PHASE 2
60
FINAL SITE SELECTION INITIAL PHASE 2
30
60
30
OJECT UNDED & STAFFED
20
FINALIZE SYSTEM REQUIREMENTS INITIAL PHASE 2
30
NEGOTIATE PBS STATION, MDS, CATV & MICROWAVE GRID UTILIZATION AGREEMENTS INITIAL PHASE 2
7
127
COMPLETE SYSTEM CONFIGURATION
60
30
CATV SYSTEMS ENG'G SITE AND TECHNICAL REQUIREMENTS SURVEY INITIAL PHASE 2
30
180
DETAILED SYSTEMS ENGINEERING
30


PREPARE AND SUBMIT, FCC APPLICATIONS
5
FCC 30 DAY PUBLIC NOTICE
60
FCC AUTHORIZATION RECEIVED
60
CONTRACT TERRESTRIAL INTERCONNECT FACILITIES & SERVICES
120
30
CONTRACT SATELLITE TRANSPONDER USE & TIME
EQUIPMENT ON PROCUREMENT BY TURN-KEY CONTRACTORS
30
BID AND AWARD TURN-KEY EQUIPMENT AND INSTALLATION CONTRACTS
120
DETAILED INSTALLATION ENGINEERING BY TURN-KEY CONTRACTOR
150
SYSTEM INSTALLATION WORK BY TURN-KEY CONTRACTORS & SUBS
30
150
TEST EQUIPMENT & SPARE PARTS ON PROCUREMENT BY TURN-KEY CONT
30
WRITE SYSTEM CHECKOUT AND TEST PLAN
30
WRITE SYSTEM PERFORM SPECIFICATIONS FOR TURN-KEY
60
WRITE MAINTENANCE AND OPERATIONAL PLANS
120
90
WRITE PLAN FOR TECHNICAL STAFF TRAINING
30
OPERATION AND MAINTENANCE STAFF HIRED AND IN TRAINING
150




PREPARE & SUBMIT FCC APPLICATIONS FOR UPLINK
30
FCC 30 DAY PUBLIC NOTICE
30
FCC AUTHORIZATION RECEIVED
FCC PRIOR COORDINATION SCPC UPLINK
E PLAN ON
180
DETAILED SYSTEMS ENGINEERING ADD ON
30
PREPARE BID SPECIFICATION FOR ADD ON EQUIPMENT AND INSTALLATION
30
AWARD EQUIPMENT AND INSTALLATION CONTRACTS
120
EQUIPMENT ON PROCUREMENT BY TURN KEY CONTRACTORS
120
PROCUREMENT TEST EQUIPMENT AND SPARES FOR ADD ON BY TURNKEY CONTRACTORS
120
120
PREPARE AND SUBMIT FCC APPLICATIONS FOR M/W ADD ON
90
FCC AUTHORIZATION RECEIVED
30
CONTINUING PLANNING, ENGG. PROCUREMENT & INSTALLATION SUPPORT FOR NEW ADD ONS


30
DETAILED INSTALLATION ENGINEERING BY TURN KEY CONTRACTORS
180
EQUIPMENT INSTALLATION WORK BY TURN-KEY CONTRACTORS & SUBS
30
ADD ON SYSTEM, TEST, CHECK OUT, AND FINAL ACCEPTANCE BY TTSD
30
ADD ON TTSD SYSTEM OPERATIONAL
150
CIVIL ENGINEERING INSTALLATION WORK BY CONTRACTORS
30
30
120
30
RENEGOTIATE COMMON CARRIER CONNECTS & DISCONNECTS
EMPLOY & TRAIN ADDITIONAL OPERATIONS & MAINTENANCE PERSONNAL

123

125

terminals will access the RCA satellite.

The Killeen terminal will also have the ability to access the WESTAR satellite simultaneously with the RCA satellite through a 10-meter, Public Broadcast Station receive terminal which will be converted at project cost to transmit capability.

The initial access capabilities will be available for operation 21 months after the project is funded.

CATV Cable Terminals. The project will provide the necessary ROTV receivers, cable amplifiers, encoder modulators and decoders to utilize the CATV distribution facilities for TTSD requirements at the following community areas:

Abilene	Laredo
Amarillo	Lubbock
Austin	Lufkin
Beaumont	San Angelo
College Station	Uvalde
Corpus Christi	Vernon
El Paso	Weslaco
Killeen	

These facilities are scheduled to be operational 21 months into the project.

The project will provide complete ROTV terminals at Brenham and Kerrville. The Kerrville terminal will feed an existing small CATV cable company. The Brenham terminal will serve the customer direct. These two terminals will also be operational 21 months into the project.

Microwave Connects. The existing microwave system owned by a consortium member will be modified and extended at project cost to accommodate the initial operational requirements. This work includes the following and will be operational 21 months into the project:

College Station. Five hops of half-duplex microwave will be constructed between College Station and Killeen. This system will permit the customer access to the transmit earth terminal to be constructed at Killeen by TTSD. This portion of the system has already been licensed by the FCC for construction.

San Antonio. One hop of full-duplex microwave will be constructed from the University of Texas Health Science Center at San Antonio as a connect to the existing microwave system. This consortium member will transmit and receive satellite signals via the microwave system to and from the Killeen earth terminal.

Ft. Worth. One hop of full-duplex microwave will be constructed from the MHMR State School in Ft. Worth to the existing microwave system. The State School will transmit and receive satellite signals via the microwave system to and from the Killeen earth terminal.

Dallas. One hop of full-duplex microwave will be constructed between the TAGER closed circuit educational microwave system control center at Richardson and the existing microwave system terminal at Dallas Skyline High School center. This connect will provide TAGER with satellite signal transmit and receive capability at the Killeen TTSD earth terminal. Ten university and college level institutions participating in the TAGER system will be served by the TTSD system through this connect. Distribution from TAGER through two ITFS microwave systems operated by Dallas-area Independent School Systems will also be possible. A full-duplex microwave system will be installed between

TAGER and Collins Radio Group in Richardson to access an existing T/R earth terminal.

Houston. Two full-duplex, one-hop microwave systems will be installed at Houston to provide satellite signal transmit and receive capability for Region IV Education Service Center and MHMR requirements. These systems will connect these TTSD members to the RCA-owned microwave in Houston, and RCA satellite uplink terminal at Rayburn.

San Angelo. Two hops of half-duplex microwave will be required between the Ballinger CATV ROTV terminal and the San Angelo CATV headin facilities to accommodate TTSD requirements.

Multi-Point Distribution. Commercial multi-point distirbution systems will be utilized in the following major communities that do not have CATV systems.

Houston	Ft. Worth
Dallas	San Antonio

Houston and Dallas are presently planning ROTV earth terminals which may be used for TTSD requirements on a scheduled basis.

A multi-point distribution center may be constructed in Wichita Falls when TTSD requirements are such that construction will be justified.

Control Center. A TTSD control center facility will be constructed at the TTSD uplink facility at Killeen. This facility will contain the uplink transmitter, control consoles, monitoring systems, data terminals, supervisory control system and input from the computerized management and scheduling system. This facility must be operational 21 months into the project.

The control center will have the responsibility for monitoring all programming, program routing, data switching and routing, remote receiver frequency assignments at the ROTV terminals and total system

status. The center will also schedule corrective and routine maintenance based on program and system priorities.

E. Expanded Systems

ROTV Terminals. After the initial operating system has been activated, the project will add the following communities to the system during the third and fourth years of the project. All of these areas are serviced by commercial CATV systems.

Big Spring	Overton
Clear Lake	Pampa
Edna	Pasadena
Ft. Stockton	Port Lavaca
Galveston	Rusk
Mexia	Stephenville
Midland	Waco
Odessa	

Microwave Extension. In order to benefit from the additional 50 percent reduction in RCA satellite transponder costs which are available to users who own transmit terminals in addition to receive terminals, it will be necessary to extend the microwave system in full-duplex mode from College Station to Houston. Full-duplex capability will be added to the system between Killeen and College Station. This extension will support existing TTSD requirements at Huntsville and Conroe, as well as those at Houston. The RCA transmit/receive terminal would then only be used as emergency backup to TTSD earth terminals.

TTSD Transmit/Receive Earth Terminals. Beginning in the 26th month, new TTSD earth terminals with uplink capability will be installed in the following order.

Lubbock	El Paso
Harlingen	Houston

These stations will be modified CATV ROTV systems. All stations will be operational by the end of the project's fortieth month.

PBS Connects. There are presently eight PBS affiliated educational television stations in Texas with receive-only earth stations. Access to these sites through the WESTAR satellite will be provided via the existing microwave system, an RF cable connect to be constructed to the Western Union transmit earth terminal at Cedar Hill. Access will also be possible at the TTSD Killeen uplink site.

During the second 24-month period of the project, additional satellite earth terminal receivers will be purchased and installed by the project at the following PBS television station communities.

Austin	El Paso
College Station	Houston
Corpus Christi	Killeen
Dallas	Lubbock

Common Carrier Connects

Return Audio Circuits. Initially the system will provide return audio to the originating point via common carrier landlines and the member-owned microwave system.

Data Circuits. Due to the initial cost of data transmission equipment for satellite systems, the present requirements to use 10-meter antennas at earth stations for both narrowband and wideband transmissions, and the existence of a state-controlled communications network utilizing common carriers, it was determined that data and other narrowband circuit requirements could be an integral part of the above noted existing network.

As the new TTSD uplink terminals are constructed, forming a cluster network, single channel per carrier (SCPC) equipment will be installed for narrowband applications. The length of common carrier narrowband circuits will be limited to a radius of some 200 miles about each earth terminal. Thus, a cluster network for satellite delivery will have been formed.

Narrowband circuits will consist of interactive data, slow scan video, interactive program audio, and administrative audio.

F. General System Specifications.

The overall system will conform to the following indicated rules, regulations and typical system technical specifications. Detailed equipment specifications are not provided in this proposal, but typical examples are available upon request.

Transmit/Receive Earth Terminals - Wideband.

Receiver

LNA 200^{o}K at 34^{o} elevation at 4GHz

Frequency Range: 3700 to 4200 MHz

Output Video S/N: 55dB minimum

EIRP 34dBW

Output Audio S/N: 60 dB min.

Transmitter

HPA: 3KW @ 5925-6425 MHz

Emission Designator: 36000F-9

Antenna Diameter: 10 meter

Frequency Control

Receivers and exciters are synthesized frequency agile with remote tuning capability in 1MHz steps.

RCTV Earth Terminals

System Performance.

Operating Frequency Range: 3.7-4.2 GHz

Earth Station G/T Ratio: 21.7 dB/^{o}K

Output Video S/N: 50 dB Typical @ EIRP 34 dBW

Output Audio A/N: 50 dB minimum

Antenna Diameter: 4.5 to 10 meter

Receivers are frequency agile with remote operation capability

CATV Cable Distribution Systems. All CATV cable distribution systems utilized in the TTSD project will comply with FCC Rules and Regulations, Volume II, Part 76, Paragraph 76.605, Technical Standards; i.e., the video signal to noise ratio shall not be less than 36dB.

Small Earth Transmit/Receive Terminal - Narrowband

Antenna Diameter: 4.5 meter

Low Noise Amplifier: 140^{o}K

Power Amplifier: 35 to 100 Watts

Convertors:

Up Converter - 70 MHz to 6GHz

Down Converter - 4 GHz to 70 MHz

Voice or Data Channel Modems (2 Channels): Single Channel per Carrier

Optional Additions: Television Receivers

RF Spacing: 30 KHz

RF Carrier Frequency Stability: ± 1 part in 10^{8}

Earth Terminal G/T: 19.5 dB/^{o}K

Operational C/KT: 53.9dB-Hz

Voice Channel Bandwidth: 300-3400 Hz

Voice Channel Noise Performance: 10,000 pwp (toll quality)

Data Transmission Capability: 9600 bits/sec at 1×10^{-6}

6. Maintenance Plan

After installation and system acceptance testing, TTSD program management will direct a complete and authoritative maintenance program to ensure maximum availability of the system. This maintenance program will include administering of warranty clauses, spare parts purchasing, test equipment purchasing, and subcontracts enforcement.

TTSD engineering will recommend items of equipment or parts thereof which should be purchased as spares, together with the quantities of the spare parts. TTSD engineering will also recommend the distribution of these spares in accordance with predetermined maintenance planning.

TTSD engineering will determine subcontractor maintenance services to properly support the program. The maintenance services will include earth station equipment, certain CATV equipment, microwave equipment, television and audio equipment, towers and antennas, and other peripheral equipment.

The basic objective of routine maintenance will be to ensure that onsite equipment is in good condition and performs to specifications at all times. Routine maintenance will be accomplished by periodic servicing and inspection. Inspection will include visual inspection where possible and determination of equipment condition by following a sequence of checks and observing visual indicators. The results of routine maintenance will be recorded and sent to the central maintenance and operations office for further study and interpretation.

The basic objective of corrective maintenance will be to ensure the equipment is in top condition at all times. Corrective maintenance will be undertaken at any time there is a catastrophic failure or if a trend of deterioration in quality is shown by the routine maintenance program. Corrective maintenance will be carried out by isolating the fault down to a replaceable subassembly or module. Normally, the item will be returned to the manufacturer for repair.

In the event the repair is within the capacity of TTSD, the item may be repaired on-station. All corrective maintenance will be recorded and sent to the central maintenance and operations office for further study and interpretation.

Technical Assistance

In the event of problems in equipment which may require the assistance of the manufacturer, the TTSD maintenance and operation office will contract such technical assistance as required. This will ensure a prompt and complete solution to difficult problems with a minimum of downtime to the system.

DATA Systems Maintenance

TTSD maintenance engineers will make periodic reviews of the DATA systems to ensure that the service and equipment are maintained to TTSD established specifications. In most instances, the DATA company involved will provide onsite maintenance of TTSD equipment utilized for DATA distribution. TTSD will provide technical support as required for those maintenance problems which are not within the technical resource capability of the local DATA company.

H. Network Development

The transition from Phase II A to Phase II B and, subsequently, from demonstration status to operation status will require extensive network development over the four-year period. The consortium will need to overcome budgetary and institutional barriers that presently prevent many potential users from participating in the TTSD. Some present networking arrangements and contracts may have to be phased out. Budget planning and, in many cases, legislative authority will have to be secured. Individual agencies will look to the Texas Legislature for appropriations. Other organizations will develop grassroots support and a variety of sources of funding. The four-year demonstration will, in effect, subsidize the participating organizations until increased usage and decreased costs combine to produce optimal economies of scale.

An essential part of the development will be the tariff model. The tariff and accompanying cost studies will allow the expenditures and other potential users to decide if the network being developed will serve their needs in a cost-effective manner. Operations Research will assist in the tariff development and provide other services to support and appraise the operational system. Periodic evaluations will ensure that experiment is making the objectives set by the organizational sponsor. Information Services within the consortium, and later, public information efforts, will help ensure the continued involvement of the network's users in its development.

The tariff that will be developed and implemented during the four-year demonstration will contain a listing of services provided and the rates applicable to each service. In addition, there will be a detailed explanation of all terms used to describe the services listed and the regulations that are developed to govern the use of the services.

The assumptions upon which the present tariff model was developed are:

1. The charges to each user will be usage sensitive. In other words, the length of time and the amount of bandwidth utilized will be reflected in the rate design.
2. Overhead or common costs will be shared based on usage and will not be site sensitive (although the investment varies at each site).
3. All users share in last mile costs.
4. The rates will encourage wider distribution of program material, since the rate for sending to one site is the same as the rate for sending to all sites.
5. At first, there will be no incentives for weekend or off-peak use, other than increasing the overall usage.
6. Inherent in the purchase of bulk time from the satellite provider is the fact that less usage for the overall system results in a greater rate per user.
7. The tariff must be easily understood and reflect the overall goals of the demonstration's statewide averaging of costs and, therefore, rates are the effective result.
8. By the end of the fourth year, all participants will be paying 100% of the tariffed rates, which will include all costs of supporting the network plus a margin for expansion and depreciation.

9. Costs for operating the distance and time sensitive portions of the network will be developed through computer modeling during the four-year demonstration.

10. All assumptions may be changed by the fiscal agent or board as new information is developed and objectives are modified.

Based on these assumptions, the following algorithm will be used to calculate the rates for 1-way video and 2-way audio.

$$\text{cost/hour} = \frac{1}{y}\left[\begin{array}{ccccc} \text{Satellite} & & \text{Microwave} & & \text{"Last} \\ \text{Monthly} & + & \text{Monthly} & + & \text{mile" (1)} \\ \text{Rental} & & \text{Rental} & & \text{costs/month} \end{array} + \begin{array}{c} \text{(2)} \\ \text{Monthly} \\ \text{Overhead} \end{array}\right]$$

where y = total number of hours/month utilized by experimenters

(1) Including MDS, TAGER and telephone company audio return charges.

(2) Including depreciation, maintenance, administration

Rates for specific narrowband uses will be set during the development of system requirement specifications.

As additional users, including present affiliate members, begin to use the network, the total number of hours used will increase, and therefore, the rate per hour will decrease.

In order to determine the costs per site and per user, the tariff model will be developed by the director working closely with the Operations Research staff.

The Operations staff will have two major responsibilities in network and tariff development: (1) to serve as a bridge between programs and technology by helping TTSD members use the system to meet educational and communication needs, and (2) to support ongoing operations management, planning, and the financial/administrative programs.

The matching of appropriate delivery and communications technologies to software needs of consortium members and prospective members is a significant planning task. The System Operations staff will work with the director by furnishing information for management decisions. Projections of future needs on a site, segment, and network basis will be formulated in order to plan ahead for expansion of the consortium and the delivery of services.

An active program of research and demonstration can orient current and new members to the potential cost-benefit of unrealized or new technologies. In particular, demonstrations by suppliers or universities can be used to illustrate narrowband applications for voice, digital, and slow-scan video. The modeling of a network with operations research techniques will make it possible for a potential user to simulate the budgetary and operational aspects of participants in TTSD.

The management of information by computer or visual displays can make possible more efficient, better informed decision-making by management. A sophisticated "corporate planning laboratory" format of information services is evident in over a hundred large organizations across the United States today. The same principles of support to management can be used to market the utility of TTSD and to make available to planners a solid base of accurate information in customized formats.

In order to further develop the data base for telecommunications planning, a statewide needs assessment will be performed. The director's office will contact state agencies and organizations whose information and education needs may be met by use of the communication network. An information inventory of each organization will point out present and potential uses of the network. Cost models developed by the operations staff will help determine the tariff rates to be charged each additional member.

These projection techniques, developed during Phase II, will enable TTSD's hybrid communication system to evolve to full operational status while making optimal use of present land-based networks.

Central Texas College
United States Highway 190 West Killeen, Texas 76541

March 14, 1978

Dr. Tom Pate, Jr.
Executive Director
Education Service Center, Region IV
1750 Seamist, P.O. Box 863
Houston, Texas 77001

Dear Dr. Pate:

Mr. Ken Fairfield, Technical Manager for the Texas Telecommunications Satellite Demonstration Project, has provided me with a letter describing the progress of the project and its requirements of KNCT-TV. Speaking as General Manager of KNCT-TV at Central Texas College, we are most anxious to assure you of our station's preliminary commitment to participate in this worthwhile endeavor. As soon as you have received approval from NIE to begin the project, please notify me so that I might describe our role and ask for final approval to participate from the KNCT-CTC Board of Trustees. I will be anxiously awaiting word from you on this matter.

Sincerely,

Alton W. Ashworth, Jr.
General Manager

AWA:dm

TAGER

P.O. Box 688 Richardson, Texas 75080
214 / 231-7211

March 15, 1978

Dr. Tom Pate, Jr.
Executive Director
Education Service Center
Region IV, 1750 Seamist
P. O. Box 863
Houston, Texas 77001

RECEIVED
MAR 21 1978
REGION IV ESC
ADMINISTRATION

Dear Dr. Pate:

We are pleased to provide this Statement of Interest in the continuing planning of activities in the Texas Telecommunications Satellite Demonstration Project. It could easily be a Statement of Commitment but for the formal approval of the TAGER Board of Trustees which is scheduled to meet on August 30, 1978. We offer this statement in support of the NIE Proposal presently being prepared by the TTSD staff.

The TAGER Television Network was conceived and designed as a broadband microwave delivery system for institutions of higher education in North Texas. Its purposes were, and today continue to be, twofold: 1) the support of academic resource sharing between participating institutions and 2) the delivery of courses and programs to professionals at their place of employment, in high technology industry, schools, hospitals, and businesses. At present our services are limited to those within microwave antenna range.

Satellite relay of certain TAGER programs and instructional materials would add significantly to the capability of professionals outside the Dallas-Fort Worth area to keep abreast of their fields in the way in which those within antenna range are now doing.

After discussions with faculty at the 10 member institutions over the possibility of extending their OUTREACH via satellite, we find sufficient interest to suggest the adaptation of some of the present TAGER programming or developing new programming in the following areas, and in cooperation with the named institutions:

Special Education: 1) Generic special education certificate program of four 3 sch courses for lay teachers in remote Texas communities. 2) In-service training for teachers in the teaching of Computation Skills, Composition and Reading. (The University of Texas at Dallas, Texas Christian University and Southern Methodist University)

Teacher Education: Certificate (and perhaps degree) programs for teachers required by law or local policy to remain abreast of new trends and developments. (University of Texas at Arlington, Texas Wesleyan College and Austin College)

Engineering and Computer Science: Credit and non-credit courses and programs for the continuing education of practicing engineers. Of some 50 live, interactive courses presently offered on TAGER for local industry, many are suitable for offering in either the interactive or the broadcast mode via satellite to remote communities. (Southern Methodist University and The University of Texas at Arlington)

Non-credit videotapes produced by local institutions as well as the Massachusetts Institute of Technology, the University of Southern California, Stanford University, and Coloardo State University (members of AMCEE) are also available to TAGER for broadcast to remote industrial locations.

Social Work: Seminars and in-service programs for social workers and other public agency professionals in the field. (The University of Texas at Arlington)

Nursing: Credit and non-credit continuing education for nurses.

Medicine: The Dallas Area Hospital Television (DAHTS) (now interconnected with TAGER) provides a daily schedule of videotaped CME programming along with the medicine grand rounds, (live) from The University of Texas Health Science Center in Dallas. Such programming is immediately available for distribution by a secure ITV Satellite System to all parts of Texas.

K-12 Elementary and Secondary Programming: Derived from the Regional Instructional Television Network, of which TAGER is a member, such programming now offered on 4 ITFS channels from 8 a.m. to 4 p.m. Would be available for statewide distribution via satellite. (Richardson Independent School District)

Master of Business Administration: A full MBA sequence of courses presently being offered to Dallas-Fort Worth industry would be available for statewide distribution. (University of Dallas)

Given the extensive microwave network connecting the 10 member institutions, both private and public, large and small, and the long experience each has had in the development and use of ITV programming at the higher education level, TAGER would provide a virtually limitless source of educational programming in many more academic and professional areas for the demonstration of the effectiveness of satellite delivery. It should be reported as well that TAGER is presently negotiating for the use of an uplink earth station owned by Rockwell, International here in Richardson, Texas. Plans include the installation of a duplex link between the TAGER switching center and the ES (3 miles apart) with dedicated use of the ES from 8 a.m. to 4 p.m. daily. Annual lease agreements would be renewable over a period of 4 years. It would be TAGER's intention to make the ES available to TTSD Consortium members via the Telecomputer Grid, should there be a desire to do so.

In addition, TAGER would be in an excellent position to distribute, through its existing ITFS and microwave facilities, programs derived from others in the TTSD Consortium.

TAGER intends to develop such of these or other programs for experimental delivery should interconnecting hardware and administrative support be made available to it. Our selection of programs and commitment to a 4-year project would be conditional on receiving such assistance and, of course, on final approval by our Governing Boards.

We are anxious to begin a serious examination of the feasibility and look forward to developing strong interdependent relationships with our colleagues in Texas under the leadership of the TTSD.

Very truly yours,

Gilbert A. Peters
President

GAP:sb

Research Institute
for Advanced Technology
United States Highway 190 West Post Office Box 1405 Killeen, Texas 76541

March 14, 1978

Dr. Tom Pate, Jr.
Executive Director
Education Service Center, Region IV
1750 Seamist, P.O. Box 863
Houston, Texas 77001

Dear Dr. Pate:

The Research Institute for Advanced Technology is charged with the responsibility for the Central Texas College computer system and microwave system, as well as the radio and television stations. Mr. Ken Fairfield, Technical Manager for the Texas Telecommunications Satellite Demonstration Project, has described for me the method in which the project would like to utilize the Telecomputer Grid if it is funded. Dr. Pate, you have my assurance that the Research Institute would be most pleased to participate in the project through the utilization of the Texas Telecomputer Grid. You also have a preliminary commitment from me to dedicate the time required on the Grid necessary to support the project. As soon as you receive notification from NIE that the project is funded, please notify me so that I might receive joint approval of the CTC Board of Trustees and the RIAT Board of Directors.

Sincerely,

Alton W. Ashworth, Jr., Director
Research Institute for Advanced Technology

AWA:dm

STATE DEPARTMENT OF PUBLIC WELFARE

JOHN H. REAGAN BUILDING, AUSTIN, TEXAS 78701

July 8, 1977

RAYMOND A. VOWELL
Commissioner

BOARD MEMBERS

JAMES H. CLEVENTS
Chairman, Temple

WILLIAM G. MOORE
Richmond

RAUL JIMENEZ
San Antonio

T. S. Hancock, Ph.D.
Director, Region IV
Education Service Center
P. O. Box 863
Houston, Texas 77001

Dear Doctor Hancock:

The Texas State Department of Public Welfare has a long-time interest in and use for the Educational Satellite Project you have been named to demonstrate. For four (4) years we have attempted to get on it for our statewide in-service training program for our more than 12,000 employees scattered across the state. More recently we have envisioned its use to reach our elderly clients and their families in our Generation Connection endeavor.

I understand there will be no cost for time on the satellite nor for the receiver portion. If there is cost for the up-link we would appreciate you so advising us.

Please consider this our application for participation in the Texas Telecommunication Satellite Demonstration of the Texas State Department of Public Welfare, which will be soon known as the Department of Human Resources.

Sincerely,

R W Vowell

Raymond W. Vowell

RWV:mc

"AN EQUAL OPPORTUNITY EMPLOYER"

July 22, 1977

Raymond G. Wormwood, Contracting Officer
National Institute of Education
Contracts and Grants Division
1832 M Street, N.W.
Washington, D.C. 20208

Re: RFP NIE-R-77-0012
Plan for Application of Communications Satellites in Education

A consortium of state agencies is being formed to determine the feasibility of using satellite telecommunications technology to give the people of the State of Texas better access to their educational and informational services. A demonstration project will be developed with Region IV Educational Service Center and the Texas Education Agency as primary participants in seeking support funds from the National Institute of Education for Phase I, the six-month planning period.

Our application of this system will be to distribute continuing medical education programs to as many Texas Department of Mental Health and Mental Retardation facilities as possible. The Texas Research Institute of Mental Sciences (TRIMS) has been actively involved in a comprehensive continuing education program since March, 1976 under a grant from H.E.W. To date, more than 11,000 hours of instruction in 35 seminars have been provided for psychiatrists, physicians, nurses, pharmacists and other professionals from state hospitals, state schools and community mental health centers in Texas. Color video programs, accompanied at times by two-way interactive audio, are an important feature of these courses. Presently our staff must travel to regional sites

for these programs or have recordings mailed or delivered to them. This results in low utilization compared to the audience which could be reached if the programs were distributed via satellite.

Evaluation of the effectiveness of the experiment will be based on comparison of the costs, both monetary and in man hours, to deliver programs. The cost of satellite transmission multiplied by the audience reached will be compared to the costs of personnel travel to regional sites, including time away from client/patient care. Costs of other means of delivering educational programs to facilities will also be considered.

Realizing the advantages to be gained by participating in such a consortium TRIMS hereby pledges its support to this project in the amount and kind given in the accompanying budget.

Sincerely,

Joseph C. Schooler, Ph.D., M.D.
Director, Texas Research Institute of Mental Sciences

JCS:dm

cc: Mike McGuyer, Principal Investigator
Robert White, Director, Medical Services Continuing Education
Daniel Sheehan, Ph.D., Director, Program Support Services, TDMHMR

encl.

The University of Texas
Health Science Center at San Antonio
7703 Floyd Curl Drive
San Antonio, Texas 78284

Continuing Education Services

(512) 696-6200

July 14, 1977

Mr. Paul M. Doulas
The State of Texas Office of State-Federal Relations
P. O. Box 13005
Sam Houston State Office Building
Austin, Texas 78711

Dear Paul:

The primary mission of The University of Texas Health Science Center at San Antonio is to train physicians, dentists, nurses, scientists and allied health professionals. Degrees offered include the Bachelor of Science, Master of Science, Master of Arts, Doctor of Dental Surgery, Doctor of Medicine, Doctor of Philosophy, and a Doctor of Pharmacy degree offered jointly with The University of Texas at Austin. The center, with its medical, dental, nursing, graduate and allied health schools, is located on a 100-acre campus in the 683-acre South Texas Medical Center. President of the UT Health Science Center is Dr. Frank Harrison. One of the major resources within the health science center is its library, which contains more than 100,000 volumes and 2,000 periodical subscriptions. Computer-produced biomedical bibliographies are available on demand in nineteen different categories. Within the library is the learning resources center which offers audiovisual materials, closed circuit television and equipment for individual and small group study. The center maintains affiliation agreements for research and teaching purposes with nearly 20 local institutions and agencies. More than $10 million in research and training grants currently apply to studies of atherosclerosis, cancer, kidney disease, immunity, nutrition and other problems.

In keeping with its goals, the University of Texas Health Science Center at San Antonio seeks to educate practicing health professionals, to focus on clinical and research excellence in appropriate areas, and to provide quality continuing professional education. Providing education for health professionals, in all stages of their careers, is a primary mission of the School and it is the best interest of the Health Science Center that, as market demand increases, proliferation of offerings not be at the expense of relevance and rigor.

March 12, 1979

Dr. Thomas Pate, Jr.
Region IV, Educational Service Center
1750 Eastex
Houston, Tx 77032

Dear Dr. Pate:

This letter was suggested by Joel Goldstein, who visited with us today regarding the Texas Telecommunications Initiative Demonstration.

While the concept is vastly exciting in its implications, it will be two years before we will see any operational utilization of the proposed system.

In the meantime, I am currently operating a fully interactive two-way system, with terminal devices in 60% of the homes in the Brookhaven area on a subscription basis. I feel there must be some educational institutions involved in interactive educational programming that might be interested in utilizing the vehicle of this system to reach teens in a home environment.

I am enclosing some clippings and articles regarding some of the utilizations of the system's capabilities. I would be interested in learning the educational possibilities of this system with any institution that might have both the interest and ability to actively participate in this type of activity.

Sincerely,

Ronald T. Kresh
General Manager

Enclo

RECEIVED
MAR 14 1979
REGION IV
ADMINISTRATION

Participation in the Texas Telecommunications Satellite Demonstration Project would certainly augment the services of the Health Science Center. This letter is to acknowledge that this Office will support and offer cooperation on the proposed project and would like to work with the other agencies involved in developing a complete telecommunication project for the state of Texas.

Sincerely yours,

George B. Vaughan, Ph.D.
Director

GBV/fd

Enc

TEXAS AGRICULTURAL EXTENSION SERVICE
THE TEXAS A&M UNIVERSITY SYSTEM

College Station
Texas 77843

OFFICE OF THE DIRECTOR

July 25, 1977

Dr. Tom Pate, Jr.
Chairman
Texas Telecommunications
System Demonstration
P. O. Box 863
Houston, Texas 77001

Dear Dr. Pate:

This is to indicate that the Texas Agricultural Extension Service, as part of The Texas A&M University System, agrees to participate in the proposed Telecommunications Demonstration Project as a member of the Consortium group organized in Texas to develop a planning grant proposal to be submitted to the National Institute of Education.

The commitment includes providing reasonable in kind personnel and support services as necessary to develop the proposed Telecommunications Demonstration request for funding should the planning grant be funded by NIE.

It is our understanding that the commitments being made at this time are subject to continued review and reevaluation, and should it become apparent that during the planning stage of the demonstration that the projects being proposed by the Texas Agricultural Extension Service cannot be implemented adequately as part of the demonstration, the agency may exercise its right to withdraw from further participation.

Within these limitations, we fully support the primary purpose of the Consortium and the Telecommunications Demonstration Project as an innovative and potentially effective communication system.

Yours very truly,

Daniel C. Hannstiel
Director

DCP:cmk
Enclosure

RECEIVED
REGION IV ESC
ADMINISTRATION

The American Educational Complex

American Preparatory Institute –:– American Technological University
Central Texas Area Foundation –:– Central Texas College
Research Institute for Advanced Technology

March 14, 1978

Dr. Tom Pate, Jr.
Executive Director
Education Service Center
1750 Seamist
P. O. Box 863
Houston, TX 77001

Dear Dr. Pate:

I would like to request that one project from the American Educational Complex be considered as an Affiliate Member in the March 31, 1978, submission of an application for Communications Satellite Project in Education. This project, Criminal Justice Services for Selected Law Enforcement Agencies and Related Organizations in Texas, will provide for some of the instructional and training needs of those locations and agencies not presently being serviced.

If the project is funded, we would like to immediately make a transition from Affiliate to Full Membership for this project.

Thank you.

Respectfully,

T. C. Smith, Jr.

T. C. Smith, Jr., Ed.D.
Director of Program Planning

par

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON, D.C. 20202

March 17, 1978

Mr. Paul N. Smolen
Assistant Coordinator
Texas Telecommunication Satellite
Demonstration
Capitol Station, P.O. Box 12697
Austin, Texas 78711

Dear Mr. Smolen:

Your letter of February 8, 1978 concerning Region IV's telecommunications satellite demonstration and the material enclosed with it were appreciated. Thank you for making them available to us. It was a pleasure to read the proposed plan and to learn of the ambitious scope of the project; hopefully your group will be able to find adequate funding to make so worth while a demonstration not only possible but also to enable the integration of its more attractive services into routine community use.

If we may be of further assistance to you please contact us.

Sincerely,

Adolph J. Koenig
Program Officer
Educational Broadcasting
Facilities Program

PLANNED PARENTHOOD CENTER OF HOUSTON
3601 FANNIN HOUSTON, TEXAS 77004 (713) 522-3976

March 3, 1978

Dr. Ralph Teter
Director
Accreditation and Special Projects
Region IV Education Service Center
P. O. Box 863
Houston, Texas 77001

Dear Ralph:

Please forgive the delay in my responding to your request at the Channel 8 Satellite Conference in Houston earlier in February. Let me assure you it is not a lack of interest that has delayed me, but just an overwhelming schedule.

Planned Parenthoods throughout Texas would be very interested in working with this project in the dissemination of basic educational programming which could be keyed for grades K through 12 and into professional areas. The vehicle by which I see this coming about is our relationship (contractural) with the State Department of Human Resources' Dr. Lewis Mondy.

Dr. Mondy has indicated a very strong interest in continuing education related to family planning, family life education (especially adolescent education), and the whole area of parenting.

I am sending under separate cover a brochure called Eleven Million Teenagers. I think you will find it quite interesting and see why that priority is high with the Department of Human Resources.

Please let me know if there is anything I or Planned Parenthood of Houston can do in getting the word out to other Planned Parenthoods, or whether we should just continue to hope for the best and work through the Department of Human Resources.

I anxiously await your directions.

Sincerely,

Richard A. Ferguson
Executive Director

tjz
cc: Dr. Lewis Mondy
Joel C. Golbblatt

Affiliated with Planned Parenthood - World Population

KCOS
EL PASO PUBLIC TELEVISION FOUNDATION
P.O. BOX 146, EL PASO, TEXAS 79942
915 542-6013

February 24, 1978

Mr. Ken Fairfield
Technical Manager
Texas Telecommunications Satellite Demonstration Project
P.O. Box 863
Houston, TX 7701

Dear Mr. Fairfield:

Thank you for your letter concerning the Texas Telecommunications Satellite Demonstration Project. I can see several interesting possibilities for a system such as you are proposing.

KCOS would certainly be interested in participating to the fullest extent possible, including being considered as an up-link terminal.

I'm looking forward to hearing from you in the future.

Cordially,

W.L. Brown

W.L. Brown
Chief Engineer
KCOS-TV

mg:LB

TEXAS A&M UNIVERSITY
Educational Information
Services

February 27, 1978

Mr. Ken Fairfield
Technical Manager
Education Service Center
P. O. Box 863
Houston, Texas 77001

Dear Mr. Fairfield:

Mel Chastain, Director of Educational Broadcast Services, has given me your letter of February 18, 1978, concerning the possible use of KAMU-TV facilities by the Texas Telecommunications Satellite project.

As you know, KAMU is a PBS affiliate but the satellite receive terminal is licensed to the Board of Regents of The Texas A&M University System. Any formal commitment of its use as part of the project would require Regents' approval. We will be happy to work with you informally in any way to see that the station's facilities are used to their fullest potential for the people of the state.

Once you have resolved the situation with PBS about use of the WESTAR satellite and we have a clear understanding of what role KAMU-TV will play in the project, we will be in a better position to seek formal approval from the Board of Regents.

We look forward to working with this important project and we will be pleased to assist you in whatever way seems feasible at this time.

Sincerely,

Leatha Miloy

(Mrs.) Leatha Miloy
Director

cc - Dr. J. M. Prescott
Dr. Wm. Tedrick
Dr. Mel Chastain

NTRB

NORTH TEXAS RADIO FOR THE BLIND, INC.

3001 BOOKHOUT - DALLAS, TEXAS 75201 - 742-9701

January 4, 1978

Mr. Paul Smolen
Office of State-Federal Relations
Post Office Box 13005,
Austin, Texas 78711

Dear Mr. Smolen:

It is our understanding through the Governor's Coordinating Office for the Visually Handicapped that there is a proposal pending for an experimental satellite telecommunications project in Texas, which will be coordinated by your office.

As the only fully-operational radio reading service for the visually impaired in the State, we would be interested in participating in such a project, given the opportunity. Our present Sub-Carrier Authorization broadcasts are conducted over the facilities of KERA-FM, Public Radio for North Texas, 6 hours perday, seven days per week.

If you would kindly keep us informed of the status of this program, together with any possibilities of our participation, it would be greatly appreciated.

Sincerely yours,

John H. Luckadoo

John H. Luckadoo
Manager

A NON-PROFIT, TAX-EXEMPT ORGANIZATION IN COOPERATION WITH KERA-FM

THE MECA CORPORATION

1115 GEMINI, SUITE M • HOUSTON, TEXAS 77058 • (713) 486-1400

February 8, 1978

Mr. Ken Fairfield, Technical Manager
Texas Telecommunication Satellite Demonstration
P. O. Box 1405
Killeen, Texas 76541

Dear Ken:

Sorry for the delay but I've been out of town. As you know, we are also getting ready to build Texas City/LaMarque/Hitchcock with about 21,000 homes passed as opposed to the Clear Lake City operation which presently passes about 2,000 homes. We will, of course, be glad to co-operate with you and your project down there as well as in Clear Lake City.

Looking forward to seeing you at the convention.

Best regards,

GRP:cw

Gerald R. Proctor

KLRN-TV

March 3, 1978

Mr. Ken Fairfield
Technical Manager
Education Service Center
P. O. Box 863
Houston, Texas 77001

Dear Mr. Fairfield:

Thank you for your letter of February 18 in regard to The Texas Telecommunications Satellite Demonstration.

While KLRN is still not able to become involved in the program or operational development of the project, we would not forego the possibility of future involvement. If KLRN studios were needed for production or an uplink transmitter possibility, we would be willing to discuss the matter further after the funding is secure.

Sincerely,

Harvey Herbet
Acting General Manager

HH:mr

CC: W. W. Willett

SOUTHWEST TEXAS PUBLIC BROADCASTING COUNCIL P.O. BOX [illegible] AUSTIN, TEXAS [illegible]

BOARD OF TRUSTEES
Officers: Chairman, Tom McCrummen, Jr.; Vice-Chairman, [illegible]; Secretary, [illegible]; Robert M. Lubo; Members: David Anderson, Roland K. Blumberg, [illegible], Christian, Wayne Danielson, Robert Davis, Jack L. Davidson, [illegible], Garrison, Lee Gage, Moss Glosserman, Martin Golding, Bet Hancock, [illegible], Harold H. Hitt, Ryan Langley, W. W. McAllister, Jack Maguire, [illegible], Barbara Nappier, Bob Roth, R. P. Schenkkan, Robert Seal, [illegible], Sutton, Leon M. Taylor, Frank Valdez, Curtis Vaughan, Jr., [illegible]

PART V: MANAGEMENT PLAN

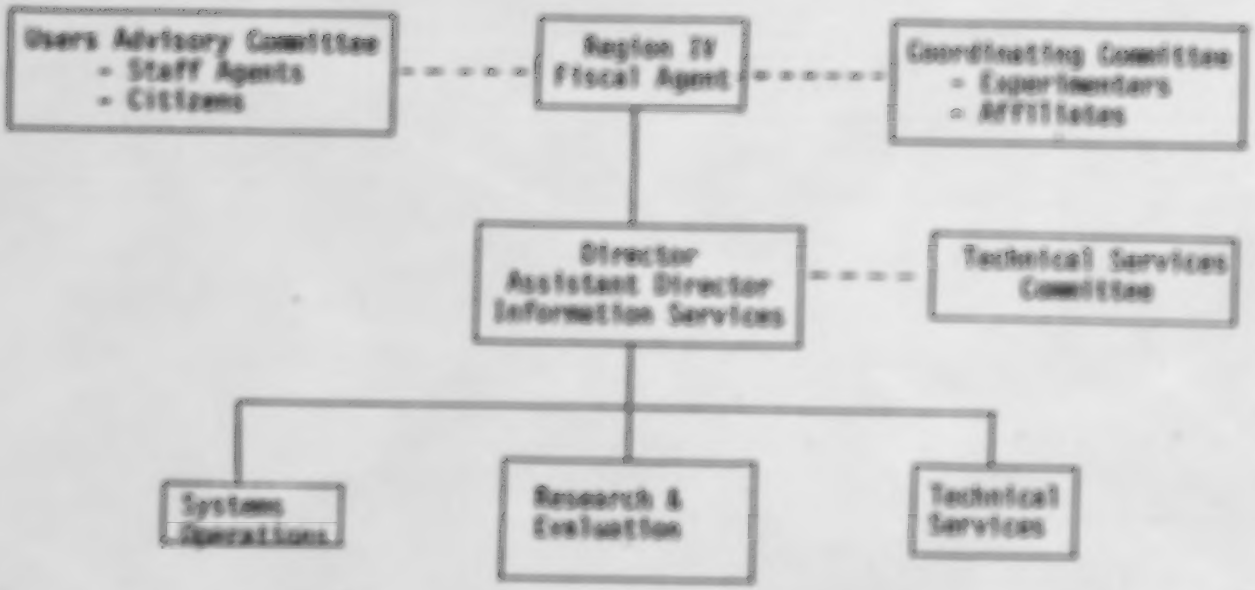
The Management Plan for the four-year demonstration is structured to allow for maximum flexibility during this crucial stage of the project, while fully utilizing existing resources throughout the State. The Plan recognizes the importance of citizens' input, as well as the necessary evolution from the planning phase through the demonstration phase, and, finally, to an operational system. The organization charts below depict the management structure during Phases II A and II B. Each phase is scheduled to last 24 months. The various parts of the management structure are explained below.

A. Fiscal Agent and Board

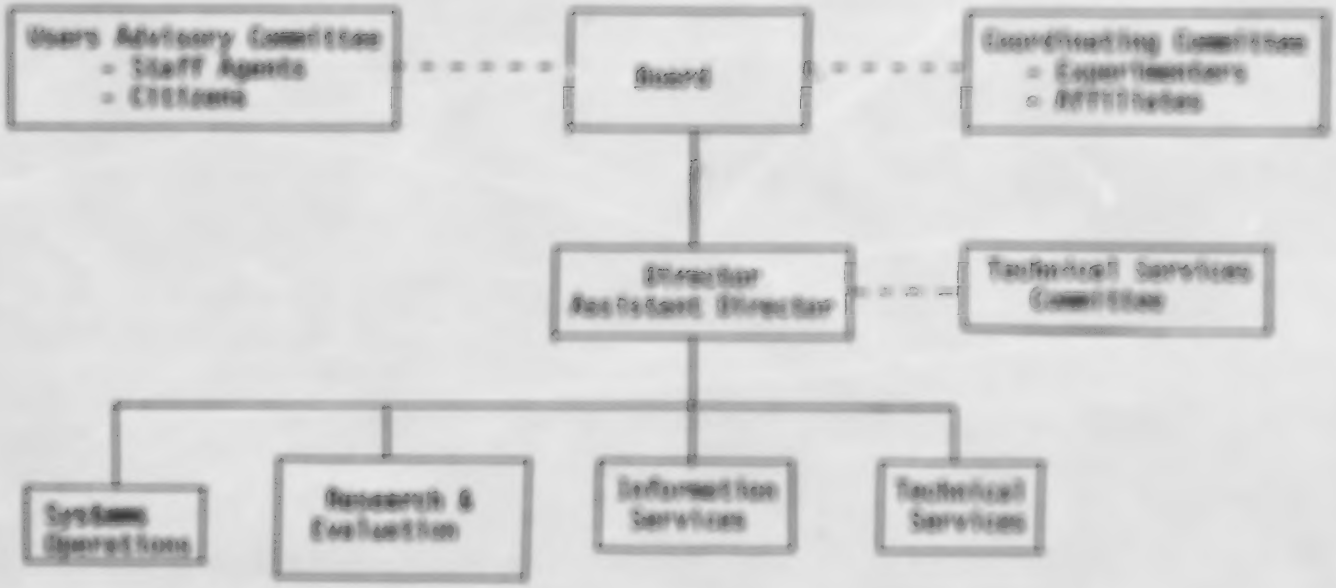
Upon funding of the proposal, Region IV Education Service Center (ESC IV) in Houston will be established as fiscal agent for the demonstration during its first two years. ESC IV has participated in the development of the TTSD since its inception. It was the fiscal agent and coordinating agency for Phase I. It has the trust of the participating agencies, as well as the Texas Education Agency which initially requested ESC IV to coordinate the development of TTSD. ESC IV is a legal entity established by an Act of the Texas Legislature in 1965. Education service centers in Texas are defined as local education agencies authorized to submit directly for funding from any source.

During Phase I, TTSD considered, but discarded the idea of immediately moving into Phase II with an independent organizational structure for implementation of the demonstration. Instead, the first 24 months of the demonstration will be used for building the new organization with ESC IV as an established organization with fully operational fiscal management and control, retaining the supervisory role as fiscal agent. During this period, the policies of ESC IV as they relate to personnel, budgeting, travel, and operations, will be used for TTSD.

PHASE II A - CONSORTIUM PLUS FISCAL AGENT



[illegible]


Users Advisory Committee
- Staff Agents
- Citizens
Board
Coordinating Committee
- Experimenters
- Affiliates
Director
Assistant Director
Technical Services
Committee
Systems
Operations
Research &
Evaluation
Information
Services
Technical
Services

Advisory

The Fiscal agent will act in a general supervisory role during Phase II A, will appoint, with the consent of the Coordinating Committee, the Director of TTSI, and will be the legal agent for TTSI.

At the beginning of Phase II B, approximately 24 months after initial funding, TTSI will become an independent organization controlled by a board. It would be premature, at the present stage, to indicate the legal status which will be selected for the organization. In general, the choice would seem to be between a public board established by Legislative Act or a non-profit organization incorporated under the laws of the State of Texas. Depending on which legal form will be chosen, members of the board would be appointed by the Governor or by the agency members of the organization. In either case, board members will be individuals knowledgeable in telecommunications and service needs of the State of Texas. They should not be directly associated with the telecommunications industry. Board members will serve in a personal capacity and not as representatives of any agency or organization.

The organizational and legal structure of the TTSI will be a priority consideration during the entire demonstration, first with respect to transition from Phases II A to II B, and later with respect to a permanent organizational structure for the organization.

B. Coordinating Committee

The Coordinating Committee is charged with prime responsibility for policy development and the monitoring of experiments and programming, approval of new committee members, and to changes of the organizational structure.

The membership of the Coordinating Committee is made up of representatives of each participating agency which will maintain one member who will serve as an institutional representative.

Agencies who have the status of affiliate consortium members can nominate a representative to participate in the work of the Coordinating Committee as an observer. Affiliate members will not have voting status.

The fiscal agent and later the board will week advice from the Coordinating Committee on general policy decisions.

C. Users Advisory Committee

User and citizen participation will be initiated immediately upon funding of the demonstration. A Users Advisory Committee will be established and work directly with the fiscal agent and, during Phase II B, the Consortium Board. Invitations to membership will be issued by the Coordinating Committee and, during Phase II B, the Board. Each experimenting agency may nominate a citizen involved in the services delivered by the agency. Since initial TTSD experiments are mostly directed at staff agents, user participation will include this group. As direct public programming is developed, the board will seek increased membership from minorities, handicapped persons, consumers, and State and community leaders. In addition, representatives of various non-profit service organizations will be invited to join the Committee.

The Users Advisory Committee will be asked to review and comment on existing and proposed TTSD projects. It will also initiate and oversee an intensive program for grass roots citizen input into the TTSD planning process. A series of 20 regional meetings of the education service centers of the State will be held. Each meeting will involve representatives of local citizen groups potentially affected by satellite projects currently planned. Ideas and discussions generated at these meetings should point to the need for additional projects. A meeting such as this was held in Houston in February with 39 citizen groups invited.

Each of the regional meetings will be addressed by a member of the Users Advisory Committee who will provide an overview of the TTSD. An orientation videotape will be shown to explain the general technique and history of satellite communications, and to provide specific information concerning projects being planned. Discussion groups will then be organized around the specific projects. The discussions will be conducted by the local coordinator for each project. As an example, the Texas Agricultural Extension Service project will be discussed by interested citizens meeting with the local Extension Service representative. Groups will discuss the specific project's subject matter, as well as the method of delivery to be used (whether television, hardcopy, etc.). They will also discuss local community needs and planning opportunities, and will identify additional groups or individuals to be involved at the local level.

All participants in regional meetings will be provided with orientation materials and meeting evaluation instruments. The results of the regional meeting evaluations will be compiled and forwarded to consortium members and to the TTSD Coordinating Committee for use in year-end program evaluation and future planning. Each person attending a regional meeting will be added to a mailing list to receive notices of any future meetings and, at no charge, a monthly TTSD Newsletter.

In this manner, the Users Advisory Committee will bring about a general awareness among potential citizen users of present projects and generate specific suggestions for new TTSD offerings.

D. Director's Office and Information Services

The director will be responsible for supervision and coordination of all staff activities. He will report directly to the fiscal agent or board of TTSD and will provide necessary staff support for the operations of the board, the Coordinating Committee and the Users Advisory Committee. He will be appointed by the fiscal agent/board after consultation with the Coordinating Committee. The director appoints all other staff members and consultants.

The supervisory and coordinating functions of the director will be implemented with the help of the Project Framework and PERT systems which are described in this proposal. The director will monitor, in particular, the third level PERT in order to recommend policy and budgetary adjustments and report to NIE on any variance. In addition, the functions of tate and ederal policy review, network tariff development, organizational development, and public information will be performed during the first two years of Phase II (Phase II A). As citizen involvement develops, the public information function will evolve into an operating division in Phase II B.

Regulatory and program development at both the state and federal levels, will be monitored by the director's office to enable the TTSD staff to react on a timely basis. TTSD will, of course, seek to take advantage of all technical advances approved by the Federal Communications Commission. Individual organizational members, as well as the members acting as a body, will seek additional funding and respond to developments in state and federal policies concerning telecommunications.

As the demonstration progresses, the director's office will continually refine the tariffs to reflect new service offerings and changes in rates for distribution. Using computer modeling techniques discussed in the section below on systems operations, recommendations will be developed concerning alternative network configurations, alternative service providers, and rates associated with these developments.

The goal of an operational network cannot be met without continued network development. For this reason, one of the first tasks will be the development of a survey instrument to further determine the statewide telecommunication needs of the non-profit organizations, educational institutions, and service agencies in Texas. This will provide for the initial input to the data base, along with the accumulating resources being used by the Operations Staff. In turn, the survey and data base will direct the development of information services to educate new and ongoing

organizations of the TTSD and stimulate interest in expanding uses of the communication network. By analyzing past telecommunications billing records and alternative ways of meeting each agency's educational objectives, recommendations can be made concerning their prospective use of the system. Only through an aggressive public information program can the system attract enough users to reach the optimal economies of scale at each level of network development.

Information services will originate from within the director's office during Phase II A. By formalizing the flow of new information and developments within the consortium and TTSD staff, continuity will be established to build credibility and a sense of cohesiveness within the project. During the Phase I planning period, the responsibility has been undertaken by the Documentation and Information Director by providing communication services to the consortium and the TTSD management team.

By the end of Phase II A, as the system becomes operational throughout the first 21 site areas, Information Services will be responsible for accommodating the needs of a public curious about the project, but uninformed. As Phase II B begins in the 25th month, an Office of Information Services will be established separate from, but under the control of, the Director's Office. While continuing intra-consortium and TTSD staff information functions, the all-important initiation of public information will begin to inform and clarify the educational benefits and services being provided by the TTSD and its members.

An administrative assistant will act as liaison to other staff and consultants as needed to facilitate the responsibilities of the director and assitant director. The assistant will schedule activities within the director's office and work closely with the Coordinating Committee and Users Advisory Committee.

A law firm will be retained to assist in securing Federal Communications Commission lincenses and negotiate contracts with service providers. These services will be supplemented by the law firm retained by the fiscal agent.

The Technical Services Committee will be responsible for advising the director on all technical aspects of TTSD operations. Specifically, the Committee will review and oversee staff activities on "Systems Operations" and "Technical Services." The Committee will prepare a report for the Coordinating Committee, at least annually, and more frequently if neeced, dealing with all technical matters pertaining to its mandate. The Chairman of the Technical Committee will attend meetings of the Coordinating Committee.

Members of the Technical Services Committee will be nominated by each participating agency. Full members of the consortium are entitled to one seat on the Technical Services Committee. Affiliate members can nominate an observer. The Technical Services Committee may seek the assistance of individuals associated with telecommunications carriers. They will be selected by the fiscal agent/board and will not receive any remuneration for their work except, upon request, reimbursement for travel expenses authorized by the director.

E. Systems Operations

Management and programming of TTSD will be assisted by a systems operations unit. In addition to a number of data management services such as payroll, accounting, and inventory control, it is planned to develop software for program management, program scheduling, and operations control, tariff development, and financial cost analysis. A failure reporting system will be developed as part of a systems fault analysis capability. The unit will also provide support in data handling for the evaluation and research activities.

The staff function of the systems operations unit is as follows:

Director: Serves as a resource person to management for relating technology to programs and services. This position requires familiarity with information services, data base management, and operations research techniques. The director is responsible for management of the operations staff.

Operations Research Analyst:

Will be familiar with synthesis and analysis techniques that will be necessary for fiscal and technical simulations. In conjunction with the director, consultants, and programmer, will be responsible for the technical aspects of the Operations support.

Consulting:

Will be drawn from the pool of Operations Research expertise to be found in neighboring universities and consulting firms on a limited basis. The university relationship brings with it the benefits of comprehensive, up-to-date research and experience, as well as immediate access to large computer resources.

Programmer:

Maintains and creates any necessary software used in support of TTSD.

Computer Clerk:

Performs input/output tasks with the terminals in the offices of TTSD.

Secretary:

Performs typing, office management, and other secretarial tasks, including those of the computer clerk as necessary.

One of the primary functions of the Operations staff is to provide computer support for the activities of administration, operations management, planning, and data services. This activity provides the director and TTSD staff with efficient administrative planning and financial management data. It supports the technical services staff in the areas of System Operation and Control. The Operations staff has the responsibility of obtaining and maintaining computer software as required by TTSD.

The primary resource used by Operations will be the data base as illustrated on the next page. Early in the implementation phase, the structure of the data base will expand to include information that will be required by the application programs. Application programs will be of three types: financial and administrative, operations management, and planning.

Data Base

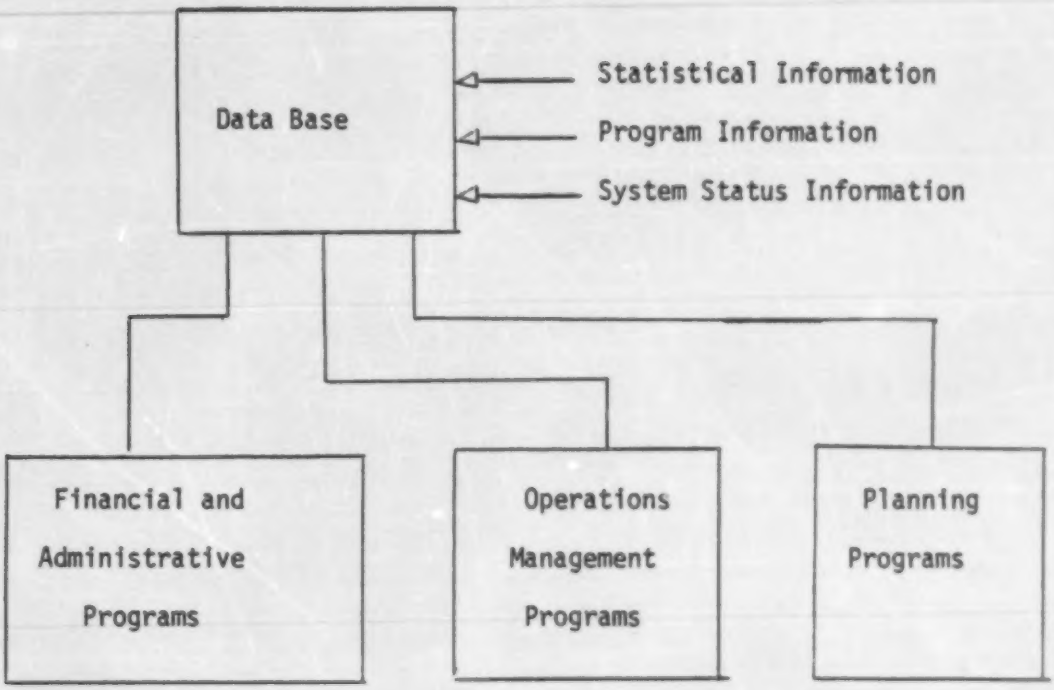
At the center of TTSD management, the data base will contain, in easily accessible form, most of the relevant data regarding programming, cost and tariff information, inventory, system status and maintenance information. Early in Phase II, a data base management system will be obtained to provide the structure necessary. Application programs will be designed to obtain data directly from the data base.

Application Programs

There are a wide variety of applications programs that will be useful to the TTSD system. Some of these will not become evident until the system is implemented and begins operation in Phase II. Representative applications appear below.

. . Financial and Administrative

. Personnel Records, Payroll and Accounting: Region IV Education Service Center will provide computer hardware and software support for these activities relating to the day-to-day administration of the organization.



Relation Between Data Base and Applications Programs

. Program Management (PERT): Phase II involves a large number of activities of diverse organizations. Program management software will provide the director and the technical services staff with capability to monitor and control these activities:

. Multiperiod Financial Simulation: This program is a simulation of the TTSD balance sheet and profit and loss statement over a multi-year time horizon. Its purpose is to investigate the financial implications of management decisions such as equipment investments, staffing and tariff setting. It will also be useful for estimating the effects of various uncontrollable factors such as costs of services purchased and fluctuations in user requirements.

. Tariff Model: This is an extension of the financial simulation which allows specific concentration on the setting of tariffs charged to users. This model will include a description of the physical distribution system so that the implications of changes in the system can be reflected in tariffs.

. . Operation Management

. Inventory Control: The TTSD system will involve ownership of a large number of items. The inventory control program is computerized and is available through Region IV ESC.

. Program Scheduling and Routing: TTSD will have a number of program sources and destinations requiring careful control of the scheduling of programs and their routing through the links of the system. This capability will be useful to the Director for Planning, and to Technical Services for real time control of the overall system.

- Maintenance Support: A procedure for failure reporting is useful to pinpoint problem areas in the electronics of the system. This will be formalized and programmed during Phase II.

- Monitoring and Status of Operations: For real time control of the operations of the Technical System, it is important that the status of the system be readily apparent in terms of the operating state of the components. An interactive program will provide this capability.

- Performance Analysis of Remote Sites: Measurement of component characteristics often signals an impending failure. This allows preventive maintenance before the failure causes a malfunction. An analysis program of this type will be prepared.

- Evaluation Support Programs: Data for evaluation will sometimes require statistical analysis. Standard statistical programs will be obtained for this purpose.

. . Planning

- Technical System Simulation: This simulation will model the technical components of the system in detail. Its use will allow for estimation of the effects of various events that might occur in the system. It could be used to determine alternative routings in the event of failure.

- System Fault Analysis: The purpose of this program is to use the technical simulation to determine reliability estimates for point-to-point communication.

- Capacity Expansion Planning: As demand for the system grows beyond the capacity for the TTSD system proposed for Phase II, new facilities will have to be built. This program will aid in determining the optimal sizes and locations of these facilities.

Computer Hardware

Access to computers will be obtained through interactive terminals located in TTSD central offices and in the Technical Operations Center in Killeen. Computer time will be leased. It is anticipated that the PERT program will be implemented on the PDP 11 at the Killeen facilities. Administrative and financial programs will be implemented in the Region IV Computer complex in Huston. The data base and the remainder of the applications programs will be implemented on the CDC 6600 at the University of Texas at Austin.

Computer Software

It is anticipated that the TAD program will be available for program management (PERT). This program is funded by NIE for the Alaskan project. The PERT program should perform the functions of scheduling and monitoring the performance of tasks and the allocations and expenditure of manhours and money.

Other software will be programmed by the Operations staff or obtained from consultants or software service companies.

F. Research and Evaluation

Research and Evaluation activities will be carried out at two levels: the level of participating agencies and the Consortium level. At both levels, detailed evaluation plans will be developed with the objective of using evaluation as a management tool for planning of future activities.

Evaluation by Participating Agencies

All agencies participating in the Texas Telecommunications Satellite Demonstration will be required to evaluate their own experiments. Where appropriate, they can use existing arrangements for evaluation of agency activities. However, evaluations must follow certain general guidelines which will be established by the Coordinating Committee in order to ensure comparability of results. Agency experiments must include a detailed evaluation plan which will be submitted to the Coordinating Committee and updated as required. Issues to be addressed in the evaluation include examination of the technical costs and quality of satellite transmission compared with other telecommunication technologies, user acceptance of satellite delivery of educational materials, and the organizational structure for satellite delivery. Status reports on each experiment will be submitted on a quarterly basis. In addition, at the end of each year each agency will produce a detailed evaluation of its experiments. This evaluation will include recommendations for change for the future development of the experiment. The entire set of annual agency evaluations will be made available to Consortium members and the TTSD Coordinating and Users Advisory Committees.

Evaluation at the Consortium Level

Evaluation at the Consortium level will consist of three groups of activities:

1. internal evaluations, both formative and summative, executed by the evaluation team;
2. special research studies prepared by the evaluation team, and
3. a major external evaluation of the entire TTSD operation.

Internal Evaluation: The planning and evaluation team will monitor agency evaluations on a continuing basis. It will prepare an annual statement to TTSD Committees which summarizes and analyzes the evaluation reports by the participating agencies. The report will highlight issues which require action on a Consortium-wide basis.

In addition, each experiment will be evaluated annually by the evaluation team. This activity will make use of information submitted by the agency responsible for the experiment. But additional information will be generated, as needed, to undertake comparable evaluations for the entire range of experiments.

Annual evaluations of experiments will be conducted in such ways that comparisons are made between satellite utilization and other transmission modes. Working closely with participating agencies the evaluation unit will study program participants of current TTSD experiments, as well as control groups receiving comparable services without use of satellites. Annual evaluations will be scheduled on a staggered basis to balance the workload of the staff.

The evaluation team will also be responsible for monitoring, on a continuous basis, the operation of the Consortium. This should provide a basis for formulating recommendations for change whenever the need arises. On an annual basis, a formal report will be prepared evaluating the Consortium in meeting its goals and objectives.

In year three of TTSD operations, the evaluation team will prepare a summative internal evaluation of all experiments and of Consortium development. This evaluation will be available to the Consortium before the end of the demonstration and will include recommendations concerning the future of the satellite project (expansion, continuation as a demonstration project, or termination).

Special Studies will be prepared by the evaluation team as needed for the operation of TTSS. Special reports may deal with such matters as the assessment of the telecommunications needs of the State on the basis of TTSS experience during the first years in operation, analysis of expansion of Consortium membership, study of alternative funding sources, and evaluation of parallel satellite demonstration projects for improving TTSS operations.

External Evaluation

A comprehensive external evaluation will be commissioned during the third year of operation. Results will be available in time for deliberation on the future of TTSS during the fourth year of operation. The evaluation will be undertaken by a group not connected with the Consortium or any of its agency members. The contract will call for an assessment of all experiments undertaken as part of TTSS, as well as Consortium planning and operations. The study should present recommendations concerning the future of TTSS.

Organization

A small evaluation team will be organized as a separate unit of the TTSS staff. The head of the unit will report directly to the TTSS Director. Under the general supervision of the Director, the unit will be available to Consortium members to assist them in improving evaluation of their experiments. In addition, the unit will assist affiliate or prospective members in completing their needs assessments and project designs prior to becoming full members. The evaluation team will be made up of an evaluator, a technical consultant, an administrative secretary, and an analyst for special studies. The evaluator and the administrative secretary will be hired when TTSS becomes operational and will work full time. The technical consultant will work on a retainer basis. The analyst for special studies will be hired on a part-time or full-time basis as the need for this function materializes, at the earliest during the second year of operation.

6. Research & Evaluation Staff

Evaluator

- Develops and administers formative evaluation system.
- Provides reports to the Consortium quarterly concerning the status of the experiments and the Consortium operation.
- Develops internal summative evaluation methodology.
- Hires technical consultants.
- Provides summative evaluation reports.
- Assists affiliate members in completing needs assessments and provides designs to enable them to become full members.
- Assists in the development of occasional experiments by both full and affiliate members.
- Does special research as needed to facilitate evaluation or management of the Consortium.

Special Studies Assistant:

A full- or parttime assistant. Helps in the preparation of special reports. Hired when needed.

Technical Consultant:

Advises the evaluator concerning technical matters which affect both formative and summative evaluation.

Administrative Secretary:

Provides organizational and clerical support to the Planning and Evaluation Team.

TIMETABLE OF MAJOR PLANNING AND EVALUATION ACTIVITIES

Activities	Months 1	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
By Each Experiment																	
Status Reports	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Evaluation Reports					X				X				X				X
By Evaluation Team																	
Summary and Analysis of Agency Status Reports					X				X				X				X
Evaluation Reports on Each Experiment							Yearly, Staggered										
Evaluation of Consortium Operation					X				X				X				X
Summative Internal Evaluation Completed															X		
Special Reports								As Needed									
By Outside Evaluators																	
Consultants Hired											X						
Evaluation Report Due															X		

H. Technical Services

Technical Services (TS) will provide technical program direction for all engineering aspects of the TTSD program. This will include system design, equipment determination, procurement requests, bid analysis, construction efforts, factory and field coordination, factory and field acceptance testing from groundbreaking to final facility operational status. Technical Service will also provide program management services such as scheduling, cost estimates, progress reports, and required interface with regulatory agencies such as FCC and FAA. Technical Services will keep management abreast of engineering program events by timely and complete progress reports.

In summary, Technical Services will provide engineering management functions as required to ensure a high quality distribution system for educational materials provided by TTSD.

I. Staffing

The TTSD Consortium consists of educational service agencies. Until such time that the TTSD project becomes a permanent operational system, it may be inadvisable to create a new systems engineering staff to formulate and implement the technical portions of the distribution system. For this reason, some staff functions may be supplied by a reputable telecommunications consulting engineering firm which has experience in handling the necessary work and operations involved in getting a project of this magnitude "off-the-ground." The search for and selection of such a firm will be conducted under the operating policies--including bid procesures--of Region IV Education Service Center.

Working under the direct supervision of the TTSD Director of Technical Services and the TTSD Technical Services Advisory Committee, the consulting engineering firm would provide staff for some of the functions and services assigned to Technical Services.

J. Program Implementation

Taking into account economics and system quality, a comprehensive review of the technical and operational requirements of TTSD will be made to determine the correct program approach. Engineers and support personnel will be assigned directly upon funding of the project to ensure the crucial initial efforts will lead to successful project completion.

The Director of Technical Services will be assigned as a single point for all technical activities.

The search and selection procedure should assure that the consulting engineering firm possess expertise in the following areas:

. TECHNICAL AREAS:

Microwave Systems	Satellite Systems
Multiplex Systems	Coaxial Cable Systems
Microwave Path Engineering	Common Carrier Systems
Digital Systems	Equipment Design
Custom Designs	Interconnect Systems
Telemetry Systems	

. ENGINEERING CONSULTING:

System Design	Performance Objectives
System Analysis	Specification Preparation
Microwave Path Design and Survey	Bid Evaluation
Frequency Coordination	FCC Filings
Equipment Specification	Expert Testimony
Acceptance Testing	Factory and Field Liaison

- PROGRAM MANAGEMENT

Cost Analysis	Traffic/Service Data Systems
Scheduling	Outside Purchasing
Acceptance Testing	Construction Supervision
Technical Compliance	Bid Review
Operations and Maintenance	Training
Engineering	

- INSTALLATION/CONSTRUCTION

Microwave Systems	Multiplex
Power Systems	Troubleshooting
Equipment Checkout and Alignment	Retrofit Installations
Digital Equipment	Base Stations
Tower Erection	Small Earth Stations
PABX	Central Office Equipment
Antennas	

A Systems Engineering Manager, a Manager of Engineering Support Services, and a Maintenance/Operations Manager will report directly to the Director of Technical Services. The various staff functions are described below. These positions will be filled in accord with ESC IV personnel policies.

Director: Technical Services

The Technical Services Director will be responsible for the successful completion of the Texas Telecommunication Satellite Demonstration Technical Services PERT. He will direct all technical facets of the program, including management personnel assignments, major financial disbursements, contract monitoring, major work schedules, review of progress reports, ensure monitoring of major milestones, develop work procedures and policies, approve certain significant engineering plans and perform other tasks as required to exercise control as required by the nature of this program. He shall also act as the liaison between the TTSD Users Advisory Committee, the other TTSD departments, and his project team in all matters concerning the program.

Upon notification of funding, an interim director will be employed to begin the technical operations and to serve as Chairman of the Technical Services Advisory Committee. This committee, composed of engineers from each member organization, will advise the fiscal agent in the process of choosing the Technical Services Director.

Assistant Director: Technical Services

The Assistant Director of Technical Services will work with coordinated responsibility and authority under the direct supervision of the Director of Technical Services. The individual will be current in all phases concerning the technical management of the project, will assist the director in all facets of the program, and will assume coordinated decision-making responsibilities during the director's absence.

Manager: Engineering Services

The Manager of Engineering Services will be responsible for the engineering and technical aspects of the program, including systems engineering, maintenance and operations, and the direction of technical services. The manager will accept and give advice and counsel to the systems project engineer, technical services manager, legal counsel and engineering consultant, and maintenance/operations manager, manage the engineering portion of the TTSD program which includes engineering personnel, assignments and workloads, exact disbursement of project engineering funds, development of operating procedures, establishment of work policies, determines subcontractor selection criteria and is the liaison between the Technical Services Director and engineering personnel.

Manager: Systems Engineering

The systems engineering manager will be responsible for the exacting engineering requirements of the TTSD program. The manager will develop and direct procedures which will bring about satisfactory completion of all engineering tasks, determine system configuration, equipment requirements and purchase necessary equipment, provide FCC coordination, produce factory test procedures, produce systems test procedures and certify that the system does meet the requirements of these specifications, provide progress reports to the technical program manager on all items under his responsibility, and work in close harmony with the technical services manager and maintenance/operations manager.

Manager: Engineering Support Services

The technical services manager will be responsible for all services of a technical nature required by the TTSD program. The individual will direct tasks such as site surveys, technical illustrators, construction, frequency plans, installation and testing, training, and systems documentation, develop procedures, schedules and methods to obtain the highest quality services commensurate with the economies of the program, and prepare activity reports of the department for review by the technical manager.

Manager: Maintenance and Operations

The maintenance and operations manager will be directly responsible for all maintenance and operational technical functions of the TTSD system. This responsibility shall include certain CATV property, earth stations, and microwave links of the TTSD system. The manager shall develop procedures for ensuring the integrity of TTSD system components. These procedures will include preventive maintenance, documentation, repair, and the supervision of skilled technicians. The individual shall maintain records of all maintenance, scheduled or unscheduled, for the purpose of observing the status of the system, and prepare maintenance reports for review by the technical program manager.

VITA ON TOM PATE, Jr.

I. GENERAL INFORMATION

Home Address:	2941 Kings Forest Drive Humble, Texas 77338
Home Phone:	(713) 358-3886
Business Address:	Region IV Education Service Center P. O. Box 863 Houston, Texas 77001
Business Phone:	(713) 868-1051

II. EDUCATIONAL INFORMATION

B.S. Degree	Stephen F. Austin State College in 1954
M.Ed.	Stephen F. Austin State College in 1956
Ed.D.	University of Houston in 1971

III. EXPERIENCE AND BACKGROUND

Present	Executive Director Region IV Education Service Center Houston, Texas
1967 - 1977	Deputy Director Region IV Education Service Center Houston, Texas
1963 - 1967	Superintendent of Schools Hardin Independent School District Hardin, Texas
1961 - 1963	High School Principal Cuero Independent School District Cuero, Texas
1958 - 1961	High School Principal Morton Independent School District Morton, Texas
1955 - 1958	Teacher

IV. PUBLICATIONS

"An Analogy of Computer Utility: From Buffalo Bill to Buck Rogers." The Journal of Educational Data Processing, Vol. 7 - No. 4, 1970.

Articles dealing with flexible scheduling in the secondary school. Published in the Best School Practices Yearbook by the West Texas School Study Council, Texas Technological University, Lubbock, Texas.

V. ORGANIZATIONAL AFFILIATIONS

Texas Association of School Administrators

American Association of School Administrators

Phi Delta Kappa

Lions Club

RALPH G. TETER

1016 Martin, Houston, Texas 77018 (713) 681-5102

Personal Data
Birth: September 6, 1927, in Oklahoma City
Married: Wife, Alice; Children, Judith Ann and David Mark

Education
Ed.D., University of Houston, '70 (Education, Administration and Supervision)
M.A., University of Houston, '53 (History)
B.A., Rice University, '50 (Chemistry, History)

Experience:
Present: Director for Special Projects, Education Service Center
'73 to '74: Director for Curriculum Services, Instructional Services, Region IV Education Service Center
'73: Project Director, The Demonstration Center for Language-Handicapped Children, Region IV Education Service Center
'71 to '72: Director for Staff Development, The Demonstration Center for Language-Handicapped Children, Region IV Education Service Center
'68 to '71: Director for Planning, Region IV Education Service Center
Visiting or Adjunct Professor status: South Texas College, '64; Pan American University, '74; S. F. Austin State University, '75; Texas Southern University, '75-'76; University of Houston, '76

Professional Activities
Administration
- Directed needs assessment studies for school districts (including the largest conducted in Texas, with 64,000 respondents)
- Prepared proposals for State, Federal, and Foundation funding
- Responsible for planning and program analysis in the area of educational data processing (time-sharing computer)
- Developed educational specifications for an information system combining television and the computer
- Liaison representative of Region IV Education Service Center with:
  - Houston-Galveston Area Council (Council of Governments
  - Units of the Texas Medical Center, Various co-operative projects with:
    - Texas Institute of Child Psychiatry
    - University of Texas School of Biomedical Sciences
    - University of Texas School of Public Health
  - Southwest Education Development Laboratory
  - Cooperative Area Manpower Planning System
- Served as Consultant to an architectural team (eight firms) in the facilities evaluation of 80 schools

- - Director of Gulf Schools Supplementary Education Service Centers (a Title III ESEA project which operated under an autonomous board of school superintendents)

- - Director of The Demonstration Center for Language-Handicapped Children (the largest educational research funded by the State)

- - Served as a member of:
  - Gulf Region Education Television Affiliates, Advisory Committee
  - City of Houston Education Steering Committee for Cable Television
  - Texas Academic Achievement Study Panel, under the auspices of the Texas Education Agency
  - Texas Information System Advisory Committee
  - State Steering Committee for Common Core of Data

- - Direct involvement in the planning and design of the "magnet" school program to promote quality education in a major district

- - Coordinated National Career Education Conference (8,000 attendees)

- - Coordinated statewide survey on computer services and member of Task Force that developed five-year State plan for computer services

- - Member, Statewide Steering Committee for Common Core of Data (to promote accuracy, consistency, and timeliness in the State reports)

Curriculum

- - Served as consultant in various curricular areas for school districts in Texas and other states

- - Developed educational specifications for and implemented a statewide computer-based instructional materials cataloging system

- - Chairman, Evaluation Visiting Committees, Southern Association of Colleges and Schools, and accreditation self-studies for seven districts

Research, Publications, and Papers (18 during the last five years, including)

"Computerized Resource Accounting System," a paper presented at the National Convention of the Association for Educational Data Systems, April 1977.

Professional Organizations

American Education Research Association
American Association for the Advancement of Science (Committee Assignments)
American Association for Supervision and Curriculum Development
Phi Delta Kappa (Chapter President, 1967-68)
Texas Association for Supervision and Curriculum and Curriculum Development (Committee Assignments)

RESUME

Paul G. Gaston

3302 Larry Lane
Austin, Texas 78722
512 - 476 - 2082

Economic Research
Public Utility Commission
7800 Shoal Creek Blvd., Suite 400N
Austin, Texas 78757

EDUCATION

1962	Roughton MacArthur High School San Antonio, Texas	
1962-6	Texas Lutheran College Seguin, Texas	
1966-8	San Antonio College San Antonio, Texas	Associate in Arts
1968-7	The University of Texas at Austin Austin, Texas	B.J.A.-Management
1973-3	The University of Texas at Austin	M.A.-Communications
1975-7	The University of Texas at Austin	M.A.-Public Affairs

EMPLOYMENT

1965-7	University Co-op, Austin, Texas	Supply Clerk
1967-8	Joske's of Texas, San Antonio, Texas Executive Training Program	Merchandise Buyer
1968-70	United States Army, Fort Dix, New Jersey and Walter Reed Army Hospital, Washington, D.C.	Medical Records Specialist
1970-72	University Co-op, Austin, Texas	Camera Sales
1972-75	Vice President of Student Affairs The University of Texas at Austin	Media Consultant
1972-75	Freelance Photography and Media Consultant (St. Edward's University, Texas Conference of Churches, The University of Texas at Austin-Schools of Education and Nursing, Lakeway Land Development Corporation and others.	
PRESENT	Texas Public Utility Commission	Economist

OTHER

1963	Distributive Education, Vice President, MacArthur High School
1968-7	American Management Association
1973-6	Austin Community Television, Public Information Director

RESUME - Paul N. Smolen

1972-4	Association of Educational Communications and Technology
1972-5	Biological Photographers Association
1976-8	American Society of Public Affairs
1976-8	Austin Society of Public Affairs
1977-8	Public Interest Satellite Association Board Member

RESEARCH EXPERIENCE

1976-7	Texas Telecommunication Satellite Demonstration - Independent Research Project at the L.B.J. School of Public Affairs
1976-7	Urban Policy Toward Low-Income Citizens - Policy Research Project at the L.B.J. School of Public Affairs
1975-6	Public Policy Toward the Arts - Policy Research Project at the L.B.J. School of Public Affairs
1973	"Public Access to Cable Television in Austin, Texas" - Master's Report in lieu of thesis.

CONFERENCES RELEVANT TO THIS PROJECT

September, 1976	Public Interest Satellite Association
November, 1976	National Association of Education Broadcasters
November, 1976	Texas Cable Association Annual Conference
February, 1977	National Institute of Education--Education Satellite Conference
March, 1977	NASA's Public Service Communication Conference
May, 1977	Executive Office of Telecommunication Policy--Federal/State/ Local Advisory Conference, Goddard Spaceflight Center
June, 1977	National Institute of Education--Educational Satellite Bidder's Conference
October, 1977	National Institute of Education--Contract Award Conference
February, 1978	Texas Cable Association Annual Conference

RESUME OF

JOEL C. GOLDBLATT

PERSONAL: 1508 Windsor Rd.
Austin, Texas 78703

512/ 477-3887

Born: February 22, 1952
Dallas, Texas
Height: 5'11"
Weight: 155 lbs.
Health: Excellent
Marital Status: Single

EDUCATION: M.A. in Radio-Television-Film, University of Texas, Austin; May, 1978

B.S. in Radio-Television-Film, University of Texas, Austin; May, 1974

Preparatory: St. Mark's School of Texas, Dallas; Graduated, May, 1970

CONSULTANT AND PROFESSIONAL EXPERIENCE:

-- Documentation and Information Director, Texas Telecommunication Satellite Demonstration, (October, 1977 - present)

-- Background research, technical information and report writing for the Texas Telecommunication Satellite Demonstration, (September, 1976 - present) (Meetings attended: Society of Motion Picture/Television Engineers, New York, October, 1976; National Association of Broadcasters, Washington, March, 1977; NASA's Public Service Communication Satellite planning workshop, Washington, March, 1977)

-- Development of media and workshop materials for the State of Texas campaign for Texas AFL-CIO, Austin, TX., (May, 1977 - October, 1977)

-- Development of media/workshop program for Texas Child Care '76, Houston, TX., (March, 1977)

-- Development and proposal writing of 60-min. science documentary film, "Lunar Laser Ranging" for PBS NOVA program, through University of Texas Astronomy Department/KLRN-TV, (May, 1976 - March 1977)

-- Background research, proposal writing for 60-min. science documentary film about environmental effects of offshore oil exploration in Alaska, "Yakutat" for PBS NOVA program through COS, Inc., Boston, Mass. (March, 1977)

-- Media and workshop materials development for Applied Research in Business, Education, and Community services (ARBEC, Inc.), for hiring the handicapped, and alcoholism workshops, (August, 1974 - August, 1977)

PRODUCTION EXPERIENCE:

Formed own corporation, Image Access, Inc. (July, 1977)
to provide state-of-the-art broadcast-quality video production facility to independent producers of video programs.

Formed own production company, Take Two Productions (March, 1976)

A list of clients:

-- Warner Bros., Los Angeles, "Outlaw Blues" publicity

-- Neal Spelce Advertising Agency, Austin: Jodan Ford, San Antonio; Lakeway, Austin; Texas Folklife Festival, San Antonio

-- G S D & M Advertising Agency, Austin: Austin Savings & Loan; Henry S. Miller Co., Austin; Point Venture, Austin

-- Bonner McLane Advertising Agency, Austin: Central Power & Light, Corpus Christi; Senator Mike McKinnon, Corpus Christi

-- Rector-Duncan Advertising Agency, Austin: Texas Department of Health Resources/Emergency Medical Service

-- Media Communications Advertising Agency, Austin: Austin National Bank; Texas Medical Association

-- ARBEC, Inc., Austin: Texas Rehabilitation Commission

-- House of Jeans, Austin

-- Capital Area Planning Council, Austin: program for the Aging

FREE-LANCE PRODUCTION EXPEREINCE:

-- Austin-Travis County MHMR Infant-Parent Program: production of program about infant care and good parenting (February, 1976)

-- "Texas Hill Country Music Review": Production Manager, Sound Recordist, and Editor for feature-length 16mm documentary about Austin progressive country music. Work included complete pre-production and production arrangements for budgeting, hiring crew and equipment, coordinating 8-track stero recording with the three-camera crew, and editing all performance and interview footage. (April - August, 1975)

-- Education Service Center, Region I, Edinburg, Tx.: Editing, post-production, sound recording, and mixing for "Fiddlin' With My Folkfeet", a 16mm documentary about the first annual Texas Folklife Festival held in San Antonio, September, 1972. (July - September, 1974)

-- John Trevino for City Council, Austin: 2" video production of TV spot for City Council race (April, 1975)

-- Cresthaven Nursing Center, Austin: Production of slide presentation about special care and training techniques for handicapped children (April, 1975)

-- L. D. Brinkman Co., Dallas, TX: Production and presentation of a three-screen slide show for showroom opening in the Dallas World Trade Center (July, 1974)

-- Pari-mutuel betting group, Austin: Production and state-wide presentation for fund-raising campaign to legalize pari-mutuel betting (April, 1974)

-- City of Asutin Planning Department: Communications/Public Relations for the Austin Tomorrow planning program. Designed to encourage citizen involvement this effort included: 35mm still photography, advertisements, printed material distribution, radio and television spot production, and graphic illustraiton of technical reports (September, 1973 - May, 1974)

-- Office of Student Financial Aid, University of Texas, Austin: production of five slide shows for student and faculty use (December, 1973)

-- Mid-Texas Communications Systems, Inc.: production of slide show on their Ft. Hood and central Texas telephone system (November, 1973)

-- University of Texas Psychology Department, Austin: Directed a Master's Thesis of children's responses, videotape and graphics (May, 1973)

-- Senator Ralph Yarbrough, Austin: production of television spots for 1972 re-election campaign with Advantage Agency, Austin (June, 1972)

-- Austin Community Television, Austin: Member of Development Committee creating public access to cable television (February 1973 - 1974)

-- Temple Emanu-El Sisterhood, Dallas: Production of a three-screen slide show and transfer to 16mm, commenorating their 50th anniversary (October, 1971)

-- Second Annual Atlanta International Pop Festival, Byron, Georgia: production of a 50-minute capsule summary soundtrack of Rock and Popular music from 1965-1070 (July, 1970)

-- Wadley Institutes of Molecular Medicine, Dallas: Volunteer internship in cancer and leukemia research, Biochemistry seciotn (Summer, 1970)

REFERENCES AND WORK SAMPLES ON REQUEST.

JURGEN SCHMANDT

Curriculum Vita
July 1977

The University of Texas
LBJ School of Public Affairs
Austin, Texas 78712
(512) 471-3272

Home:
11 Hull Circle
Austin, Texas 78746
(512) 327-2317

PERSONAL

Age 48. Grew up in Germany. Later lived in France. Moved to U.S. in 1965. Became U.S. citizen in 1970. Married to Denise Besserat. 3 sons.

EDUCATION

University of Bonn, 1949-1954. Dr. Phil. (Political Philosophy), 1956. Studied philosophy, history, and international relations.

MAJOR JOBS HELD

Since 1971

The University of Texas, LBJ School of Public Affairs, Professor. Acting Dean, and Associate Dean, 1976-77.

Classes taught: Policy Planning - Science, Technology, and Public Policy - The Welfare System.

Research Projects: Technology Transfer for the Elderly - Information and Referral for the Elderly - Federalization of Cash Assistance for the Aged, Blind and Disabled - Delivery of Social Services - Policies for the Aged - Public Access Television - Child Development Policies.

1965-1970

Associate Director, Harvard University, Program on Technology and Society.

Responsible for program administration. Participated in program planning and development. Taught one course per year at Graduate School of Business Administration. Held additional appointment as Research Associate, John Fitzgerald Kennedy School of Government.

JURGEN SCHMANDT

Curriculum Vita
July 1977

1960-1964

Head of Section, National Science Policies, Organization for Economic Cooperation and Development, Paris.

Responsible for launching series of studies on national science policies of member nations and the U.S.S.R. Also served as Secretary, Secretary General's Ad Hoo Group on Science Policy.

PUBLICATIONS

In areas of political philosophy, science and public policy, welfare policies, delivery of social services, and public affairs training.

CURRENT CONSULTANCIES

Office of Technology Assessment, U.S. Congress - NASA, Technology Utilization Program - American Association for the Advancement of Science - Texas Department of Public Welfare.

MAJOR PROFESSIONAL INTERESTS

Science and technology in national and international affairs.
Cash assistance and social services planning.

KENNETH G. FAIRFIELD

RESUME

Summary

Has had more than twenty years of experience in engineering associated with radio communications and related systems. This includes multiplex equipment, teletype equipment, high speed wideband data modems, line equalizers, intercom systems, public address systems, HF/VHF/UHF radio transmitters, receivers, and antennas. Also has had varied experience in microwave systems, troposcatter systems, teletype equipment, cable installations, audio/digital patching facilities, control consoles, telephone links, navigational aids, mobile communications equipment, site surveys, equipment costs, spare part requirements, maintenance procedures, test equipment, test support requirements, minor circuit design, UHF CapCom equipments, communications control, shipboard systems design, and administrative responsibilities.

Education

Studies in Electrical Engineering, Purdue University Extension, Ft. Wayne, Indiana and Rollins College Extension, Patrick AFB, Florida. Additional studies in professional engineering refresher courses, Brevard Community College, Cocoa, Florida. Completed military and industrial technical training in solid-state devices, radar and communications systems.

Professional Experience

Research Institute for Advanced Technology/Central Texas College, Killeen, Texas (1972 - present). Is presently the Director of Engineering and Communication Services. As Director, has the responsibility for

engineering, installation, and operation of the following: KNCT-TV, KNCT-FM; Microwave facilities (Telecomputer Grid and TV STL-INTERCITY); Telephone Systems, data transmission; audio systems, video production facilities; and mobile radio and TV systems. Has direct supervision of personnel qualified in the technical engineering and operation of the above listed systems and facilities.

In addition, provides consultation to other college staff members responsible for the preparation of proposals, grant applications, and research and development projects. The department develops cost estimates, prepares technical and bid specifications, negotiates contracts and participates in all phases of projects involving telecommunications.

RCA, Cocoa Beach, Florida (May 1968 - September 1972) - As an Engineer on the RCA Missile Test Project for RCA, was responsible for engineering, during procurement, installation, and operation of radio communications systems. Conducted studies and operation of radio communications systems. Also conducted studies and surveys to determine equipment and site requirements for communication systems, including microwave paths and skyway propagation studies. Assisted in preparation of equipment purchase request and requests for proposals. Provided engineering services and supervision during procurement and installation. Prepared acceptance tests and determined the acceptability of new and modified installations. Performed quick reaction systems engineering, installation and field support engineering for the Air Force Eastern Test Range Communications requirements.

RCA, Cocoa Beach, Florida (June 1958 to May 1968). As an Associate Engineer on the RCA Missile Test Project, was responsible for communications acceptance of the Range Instrumentation Ship Twin Falls. This included

the monitoring of the installations by contractor and making major and minor equipment changes to improve all communications systems.

Other Major Projects

RCA Communications Project Engineer for Twin Falls Ranger modification. This included complete system design, supervision of installation, checkout and acceptance.

RCA Communications Project Engineer for Surveyor Project Tracking Vessels.

RCA Communications Project Engineer for initial Indian Ocean Tracking Station located in the Seychelles Islands.

RCA Communications Project Engineer for USNS Vanguard NASA Apollo Project Tracking Ship.

RCA Communications Project Engineer for Signature Tracking Ships.

Assisted in the development of Bush Station Telephone Communications concepts for RCA ALASCOM. This was part of the successful proposal which permitted RCA to purchase ACS from the U.S. Air Force.

Developed the technical portions of the initial proposal for Common Carrier Communications support for the original Trans-Alaska Pipe Line System. This included both terrestrial microwave and satellite communication systems.

Dr. F. L. Smith

An experienced educator and administrator, Dr. Smith has been engaged in the research, development, and implementation of educational and career program curricula throughout most of his 18-year career. Presently with American Technological University, he is Director of Program Planning and Development, through which he is actively involved with program development within American Preparatory Institute and Central Texas College, both parts of the American Educational Complex, Killeen, Texas. Dr. Smith's responsibilities include aiding in the planning, development and implementation of competency-based curricula designed within an individualized, modular format for an extremely specialized military and civilian student population. This background has included Systems Design in Areas of Basic Skills, Vocational Training, Career Education, Bilingual Career Education, Postsecondary Education, Job Skills Training, and High School Diploma and Specialized Programs.

Recent experience has focused on design and development of a competency-based adult high school program (primarily military students) that ranges from preseconday basic skills development (with emphasis on reading) to a comprehensive high school diploma with vocational options. In addition, work has focused on the development of competency-based bilingual instructional materials and techniques for limited English-speaking adults.

Prior to his present position, Dr. Smith was Manager of Curriculum Research and Development for RCA Education Services at the Southwest Regional Center in Dallas, Texas. He has been associated with RCA from May 1971 to July 1974. In the position as Manager of Curriculum Research and Development, Dr. Smith was responsible for directing the development of a staff training model in career education. He also developed a model for integrating career education concepts with major academic courses (grades 7-9) for the Delaware State Department of Public Instruction. Concurrently with these activities, Dr. Smith served as consultant to ATT Educational Technology Experiment, Federation of Rocky Mountain States, Inc., and designed a structure and management plan for developing the career educational materials to be used in the Satellite Project. He also contributed greatly to massive staff development efforts in Washington, D.C., West Virginia, North Carolina, Michigan and Dallas, Texas in career education.

Previously, as Manager of Curriculum Development, Dr. Smith directed the career education and program development activities pertaining to a continuous progress system for grades 10 through 12 at the Skyline Career Development Center in Dallas, Texas. While in that position, he directed the development of an individualized, flexible, modular curriculum model for 14 clusters in career education. His duties included hiring and training a professional staff to write, edit, and implement the program and recommending both hardware and software to support the program. He also made recommendations for facilities and instructors. In addition, he maintained liaison with the teaching staff of the Dallas Independent School District, and educational auditor, appropriate DISD management, and members of the Skyline Advisory Board and Advisory Committees during development

development and implementation of the program. The Skylab Career Development Center program was cited by the U.S. Assistant Secretary of Health, Education, and Welfare for Education, Sidney Marland, Jr., as a national model for career education.

Dr. previously held positions in high school, junior and senior colleges, and universities and has also directed training efforts during his service as a U.S. Army Officer in Germany. His experiences ranges from classroom teacher to departmental chairman and includes the development of teacher training programs. In addition, he has also served as consultant to various school systems and state agencies.

From 1967 until 1971, Dr. Smith served on the staff of the College of Education at the University of Houston as Instructor and Co-Ordinator and Principal Instructor, Physical Science In-Service Institute. In the latter position, he was fully responsible for coordinating an interdisciplinary instructional staff and directing laboratory experiences in science and teaching methodology. He also coordinated the program with the Texas Education Agency and the University of Texas to upgrade the physical ? texas program in Texas.

Dr. Smith previously was Chairman, Physics Department, and Director of Financial Aid and Veterans Programs at Blinn College, Brenham, Texas, from 1964 to 1966. As Chairman, he coordinated the physics program with the total curriculum for teacher preparation and engineering. From 1961 to 1964, he served as Executive Officer and Battery Commander of a weapons unit in Germany. During this period he was responsible for the total training effort for a classified weapons system and accountable for a hardware system in excess of $3 million.

Dr. Smith began his career as an Instructor of Physics and Mathematics at the Cleveland, Texas, High School, holding this position from 1959 to 1960. He also served as an Instructor in these subjects at San Houston State University, where he also participated in program development for Teacher Preparation.

Dr. Smith received his B.S. degree in Physics and Mathematics and his M.Ed. degree in Administration and Physics at San Houston State University. He received his Ed.D. degree in Curriculum and Instruction from the University of Houston. He is a member of Sigma ? Sigma and Phi Delta Kappa. Among his professional organizations are the American Educational Research Association, National Science Teachers Association, and AAUP. Dr. Smith has published numerous articles and has independently conducted nationwide research projects.

Dr. Clifford A. Peters, 1973 to date: President of TWIEB with overall responsibility for administration and direction of all TWIEB activities and programs, and with board-directed responsibility to define and develop new dimensions of service and program among TWIEB member institutions and for a large variety of TWIEB off-campus professional clientele groups accessed by the TWIEB interactive educational television system. 1972-1973: Assistant to the Vice President for Academic Administration and Research at U. Wisconsin at Southern California at Los Angeles, with responsibility for directing and coordinating a three-institution (USA, USC, Cal Tech.) study for sharing computer, library and academic resources, funded by federal and private foundation support. Prior experience: Dean of Instructional Services, Dean Emeritus and Tenured Dean of Students, California State Polytechnic College, with associated teaching assignments in both positions.

Russell F. Peters, 1969 to date: Executive Director of TWIEB and, with appointment of Dr. Peters as TWIEB President in 1973, responsible for administration and direction of all TWIEB activities and programs. 1962-1969: Assistant to the President, Southwest Center for Advanced Study, participating in policy formulation for and development of major programs of scientific research and related educational activities. 1959-1962: Executive Dean of Graduate Studies at Delaware, with major responsibilities for program development and direction of global programs in geophysics, including planning/construction of scientific equipments for first US satellite program. Prior experience: administration posts for scientific research endeavors and, as research physicist, in actual conduct of scientific experiments.

E. Lee Trundle, 1968 to date: Assistant Executive Director of TWIEB with full delegated responsibility for business and financial management of TWIEB affairs, including management of fixed assets, related financial/management liaison with TWIEB member institutions and participant industrial firms and subcontractors school districts. Duties, management and financial responsibilities for construction of TWIEB television system expansion, contract negotiations and liaison with television/electronics equipment suppliers. 1952-1968: Major management responsibilities with Collins Radio Company in product, materials and engineering support responsibilities, including field analysis and engineering. Both electrical engineering and engineering administration degrees.

George E. Krutilek. 1967 to date: Director of engineering for TAGER Television Network with broad responsibility for overall systems design, development and operations, including direction of engineering staff in daily systems operation and maintenance. 1961-1967: Plant manager positions responsible for design, development and production of advanced radio/television electronics and systems. 1949-1961: Engineer and Chief Engineer for WFAA/KBTF commercial radio and television stations with broad responsibility systems development, procurement and operation of advanced and sophisticated television and radio facilities.

J. Christopher Pruszynski. January 1977 to present: Director of Instructional Development for TAGER with broad responsibility for instructing and aiding TAGER faculty in use of television as a teaching medium (preparation and presentation of materials, use of special media, aids, etc), planning, producing and/or conducting seminars, workshops and demonstrations concerning teaching via television, operator training etc. 1969-1977: At Michigan State University in progressively more responsible position as television Producer-Director of live and video-taped credit courses and programs, including responsibility for working with faculty and production crews in optimum application and use of television as a teaching medium.

Patsy S. Tinsley. January 1977 to present: Director of Continuing Professional Education for TAGER with broad responsibility for identifying and providing the continuing educational needs for a variety of professional clienteles accessible to TAGER in off-campus receiving classrooms; responsible for providing credit courses, non-credit and short courses, video-taped credit and credit-free programs, and for planning and executing market strategies that will help TAGER develop and expand its educational service for such groups. 1975-1976: Graduate Assistant in the Graduate School of Management, University of Dallas while in the course of obtaining MBA degree with high scholarship. Prior experience: Successively, Youth Program and Education Director for local Methodist Church.

CURRICULUM VITAE

NAME: Jonna Lee Masters, M.Ed.

OFFICE ADDRESS: The University of Texas Health Science Center
Continuing Education Services
7703 Floyd Curl Drive
San Antonio, Texas 78284

PLACE AND DATE OF BIRTH: Harlingen, Texas July 26, 1937

FAMILY: Children - Susan Elaine Masters, Born April 22, 1964
Lauren Elizabeth Masters, Born December 21, 1965

EDUCATION: 15 hours toward Ph.D., University of Texas at San Antonio, 1975-1976
M.Ed., Trinity University, San Antonio, Texas, 1959
B.S., Trinity University, San Antonio, Texas, 1962

EXPERIENCE: Teleconference Coordinator, UT Health Science Center at San Antonio 1975 to present

Teacher, Northeast Independent School District 1973-1975

Advisor to French Broadcasting System about Education Television 1972-1973

Curriculum Specialist and Teacher, Pershing Hall School, Paris, France 1970-1973

Project Assistant, United States Agency for International Development, Nairobi, Kenya 1969-1970

Curriculum Advisor and Teacher, Jack and Jill School, Addis Ababa, Ethiopia 1966-1969

Secretary to Administrative Officer and Ambassador, United States Embassy, Monrovia, Liberia 1963-1964

Television Science Teacher, KLRN-TV, Austin, Texas 1962-1963

Teacher, Northeast Independent School District, San Antonio, Texas 1959-1963

SCHOLARSHIPS OR AWARDS: National Honor Society, 1955
Business Administration Scholarship, 1955-1957
Who's Who in American Colleges and Universities, 1959

PROFESSIONAL ORGANIZATIONS: National Education Association

PUBLICATIONS:

Masters, J. L., "Teleconferencing in Texas", TELEPHONE IN EDUCATION, University of Wisconsin Press, 1977.

Masters, J. L., "Teleconferencing Network of Texas-TNT" SOUTH TEXAS CONTINUING HEALTH EDUCATION, Vol, I, (2), 1977.

Masters, J. L., A SYSTEMATIC APPROACH TO TEACHING READING TO NON-ENGLISH SPEAKING CHILDREN, Ethiopian Print, 1968.

Masters, J. L., Editor, Correlated Curriculum in Social Studies, Science, and Health, Northeast Independent School District, 1963.

Various magazine and newspaper articles while in France, Kenya, and Ethiopia on education, adjusting to life overseas, health precautions, etc.

PRESENTATIONS:

Masters, J. L., "Teleconferencing for Hospital Administrators," Continuing Education for Health Professionals, Trinity University, 1977.

Masters, J. L., "Telephone Costs for Teleconferencing," Center for Disease Control, 1977.

VITA

Michael Douglas McGuyer

Born: March 9, 1947

Married, no children

Education:

Texas A&M University, 1965 - 1967		Math & Architecture Major
University of Texas, Austin, 1972	B.S.	Radio-TV-Film Production
University of Texas School of Allied Health Sciences -	32 hrs.	Biomedical Communication

Employment History:

Sept. 1976 - Present	Instructional Media Coordinator Medical Services Continuing Education Texas Research Institute of Mental Sciences Texas Department of Mental Health and Mental Retardation 1300 Moursund Avenue Houston, Texas 77030 (713) 797-1976
July, 1975 - Sept. 1976	Instructional Media Coordinator University of Texas School of Nursing at Houston 1100 Holcombe Boulevard, 15th Floor Houston, Texas 77025
Jan. 1975 - July, 1975	Media Technician for University of Texas School of Nursing at Houston
July, 1973 - Sept. 1974	Comptroller and Design Coordinator for Imaginative Game Machines Corporation Austin, Texas
March - June, 1973	Media Consultant, Austin, Texas

Following graduation from the University of Texas in May 1972, I traveled and worked at odd jobs, then sought work in the media field in the Austin area.

Production Activities:

Produced, directed, and edited black and white videotape to be used as a tool for interaction in a workshop on "Human Relations," consisting of an introduction and 16 vignettes to which participants are asked to react. 15 minutes, February - April, 1976.

Directed a series of videorecordings of Anatomy and Physiology lectures for use in the Nursing School's curriculum. Four programs 1½ to 2 hours in length, black and white, January - April 1976.

Produced a 12 minute slide/tape show to orient and motivate new faculty to the services and facilities of the Learning Resource Center of the University of Texas System School of Nursing at Houston. This project involved script writing, photography, graphic production and audio recording, August, 1975.

Produced a 13 minute slide/tape show to orient returning students to new procedures, services and facilities in the Learning Resources Center of the University of Texas System School of Nursing at Houston, August, 1975.

Supervised media support services and directed video recording of TRIM's annual symposium on child psychiatry at Sheraton Houston Hotel, September, 1976.

I presently manage the development of a new audiovisual support services section serving Texas Research Institute of Mental Sciences and the Continuing Education program of Texas Department of Mental Health and Mental Retardation. My responsibilities are to provide efficient, quality services to a local client group of 400 and to a statewide system of 20 TDMHMR facilities requiring continuing training for medical professionals.

Related Positions:

Co-chairman, Texas Association for Educational Technology Special Interest Group on Health Professions Education, 1976 - Present.

Student representative to the Curriculum Committee of the Program in Biomedical Communications, University of Texas School of Allied Health Sciences, 1976 - Present.

Designated representative to the Educational Materials Resources Committee of the Texas Medical Center at Houston, 1976 - Present.

CURRICULUM VITAE

NAME: George Bigler Vaughan, Ph.D., M.B.A.

OFFICE ADDRESS: Continuing Education Services
The University of Texas Health Science
Center at San Antonio
7703 Floyd Curl Drive
San Antonio, Texas 78284
Telephone (512) 696-6295

PLACE AND DATE
OF BIRTH: Pittsburgh, Pa. October 7, 1940

FAMILY: Wife - Dianne Garrett Vaughan
Children - Jenkins Holt Vaughan, Born July 30, 1973

EDUCATION:

M.B.A., University New South Wales
National Business School of Australia;
Sydney, N.S.W., Australia
Organizational Psychology Nov., 1971

Ph.D., Virginia Polytechnic Institute,
Blacksburg, Va.
Organic, Medicinal Chemistry Dec., 1967

M.S., Virginia Polytechnic Institute,
Blacksburg, Va.
Chemistry with minor in
Biochemistry July, 1964

B.S., Tulane University,
New Orleans, Louisiana June, 1962

EXPERIENCE:

Director, Continuing Education Services,
University of Texas Health Science
Center at San Antonio, and Assistant
Professor of Bioengineering 1976-Present

Associate Director, Roberts Center for
Continuing Education in the Health
Sciences, Baylor University Medical
Center and Univ. of Texas Southwestern
Medical School, Dallas, Texas 1973-76

Adjunct Assistant Professor, Institute of
Environmental Studies, University
of Texas at Dallas 1973-76

Lecturer, Southern Methodist University
School for Continuing Education 1973-74

Lecturer, Southern Methodist University
School of Law 1974-76

FELLOWSHIPS: Teaching Fellowship, Virginia
Polytechnic Institute 1964

Study of Carcinogenic Polynuclear Aromatic
Hydrocarbons, (NASA) 1960

UNESCO Teaching Fellowship, University of
New South Wales, Sydney,
N.S.W. Australia 1970

PROFESSIONAL ORGANIZATIONS: Sigma Xi
American Chemical Society
National Institute of Chemists
Phi Lambda Upsilon
Greater Dallas Nutrition Council
Blacklands Council of Hospital Educators
Texas Association for Community Services and
Continuing Education

PUBLICATIONS: Yen, T.F., Boucher, L.J., Dickie, J.P., Tynan, E.C., Vaughan, G.B., "Vanadium Complexes and Porphyrins in Asphaltenes", J. Inst. Petrol., 55; 87-99 (1969).

Yen, T.F., Tyman, E.C., Vaughan, G.B., "Electron Spin Resonance Studies of Petroleum Asphaltics" in Spectrometry of Fuels (R.A. Friedel ed.) Plenum Press, New York (1970), Ch 14, 187-201

Vaughan, G.B., Rose, J.C. and Brown, G.P., "Polyimides Based on Pyrazinetetracarboxylic Dianhydride and Some Related Model Compounds" J. Polym. Sci, Part A-1, 9(4), 1117-11138 (1971)

Vaughan, G.B., Vingiello, F.A., "The Synthesis and Properties of Some 7- and 12- Cycloaliphatic Benz (a) Anthracene Derivatives", Australian J. Chem., 25, 561-7 (1972).

Vaughan, G.B., Tynan, E.C., Yen, T.F., "Vanadium Complexes and Porphyrins in Asphaltene. The Nature of Highly Aromatic Substituted Porphins and their Vanadyl Chelates", Chem. Geol., 6, 203-219 (1970).

OCCASIONAL PAPERS:

Vaughan, G.B., Dunphy, D., "A Growth Model of the Building and Construction Industry in Australia", University of New South Wales, Graduate Business School, Sydney, N.S.W., Australia (1971).

Vaughan, G.B., Yap, R., "Analysis of Royal Prince Albert Hospital", University of New South Wales Graduate Business School, Sydney, N.S.W., Australia (1972).

PRESENTATIONS:

Vaughan, G.B., Tynan, E.C., Yen, T.F., "The Synthesis and Characterization of Some Meso-substituted Tetra-aryl Porphins and their Vanadyl Chelates" 155th Natl. Mtg., Am. Chem. Soc., Div. Organic Chem., Paper No. 209, San Francisco, April, 1968.

Tynan, E.C., Vaughan, G.B., Yen, T.F., "E.S.R. Characteristics of Vanadyl Aromatic Meso-substituted Porphins", Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Cleveland, Ohio.

Vaughan, G.B., "The Synthesis of Some 7-and 12-Cycloaliphatic Benz (a) anthracene Derivatives" 134th Natl. Mtg., Am. Chem. Soc., Div. Organic Chem., Chicago, Sept., 1967.

Vaughan, G.B., "Professional Job Hunting and Career Guidance" Southern Methodist University, Division of Continuing Education, Dallas, Sept. - Dec. (1973), Jan. - Mar. (1974).

GRANTS AND AWARDS:

A Model Program for the Design and Implementation of a Continuing Medical Education Service for Improving Quality of Medical Care
Regional Medical Program of Texas - $31,751, 1974-75

Medical Continuing Education Series on the Effects of Alcoholism
Texas Commission on Alcoholism - $37,323, 1974-75

PERSONAL EXPERIENCE RECORD

NAME: Arley W. Carter

EDUCATION: B.S. & M.S. Degree in Elect. Engr.

WORK EXPERIENCE:

4 Years — Director of Computer Services, Region IV ESC - Responsible for the operation of the Gulf Texas Multi-Regional Processing Center which is the largest cooperative Data Processing Service for public schools in the U.S. (serving over seven hundred schools with 450,000 students). Computer hardware consists of two Control Data Cyber 172 Computers interconnected with forty mini computers. Serves thirty-seven high-speed Remote-Job-Entry terminals and 250 low-speed terminals.

10 Years — Information and Data Management - Analysis, design and operation of large-scale and small-scale systems, on-line, off-line, real-time, batch, distribution resource, and multistructured data base. Included extensive project management and control. Included the management of the Apollo Program Failure Data Center and nonmetallic Materials Information Center.

7 Years — Electronics Systems - Analysis, design and test of complex controls systems and electronic devices. Included responsibility for the systems test of the nations first weather satellite, Nimbus.

WILLIAM E. TEDRICK ----- Texas Agricultural Extension Service

EDUCATIONAL BACKGROUND - B.S. in agricultural education, 1952, Ohio State University; M.A. in adult education, 1960, University of Maryland; Ph.D. in communications, 1968, Michigan State University.

EXPERIENCE - Vocational agricultural teacher, Wellington, Ohio, 1952-53; associate county extension agent, 1953-59, Lorain County, Ohio; program specialist, 4-H, 1959-65; program leader, 4-H youth programs, 1965-71, Michigan Cooperative Extension Service; editor and head, Department of Agricultural Communications, 1971 - present.

HONORS RECEIVED - National 4-H fellowship, Washington, D. C., 1957-58; USDA Distinguished Service Award, unit citation, Michigan 4-H youth programs, 1964; President's Citation, Michigan 4-H Youth Worker's Association, 1966; honorary chairman, Michigan Association of International Exchange Students, 1970.

AREAS OF SPECIALIZATION - In addition to giving overall administrative leadership to the Department of Agricultural Communications, Dr. Tedrick has training and experience in educational work related to communication theory and process, communication research design, diffusion of information, small group communication, group dynamics and instructional uses of electronic media, particularly videotape recordings.

RESEARCH AND TEACHING - Presently holds a teaching appointment (parttime) with the Department of Communications, Texas A&M University, teaching a graduate course in Communication Research and Theory. In addition, research programs to determine the impact of written communications on selected agricultural audiences, and how agricultural scientists perceive their role in using mass media channels to communicate about their research were conducted in 1971, 1974 and 1976. Reports on the research have been presented to the International Communications Association, The American Association of Agricultural College Editors and the Southern Association of Agricultural Scientists, professional organization in which membership is held.

PROPOSED BUDGET

Salaries	Year 1	Year 2	Year 3	Year 4
Professional				
Director, Project	$ 32,000	$ 33,000	$ 34,500	$ 36,000
Assistant Director, Project	28,000	29,000	30,000	31,500
Administrative Assistant	14,000	14,500	15,000	15,500
Director, Technical Services	31,500	32,500	34,000	35,500
Assistant Director, Technical Services	27,500	28,500	29,500	31,000
Technical Manager	25,500	26,500	27,500	29,000
Systems Engineering Manager	23,500	24,500	25,500	27,000
Engineering Support Services Manager	21,000	22,000	23,000	24,000
Maintenance & Operations Manager	19,000	20,000	21,000	22,000
Evaluator	20,000	21,000	22,500	24,000
Special Studies Assistant	-0-	-0-	10,500	11,000
Technical (Consultant (1/2 time)	5,000	5,000	5,000	5,000
Director, Operations	28,000	29,000	30,000	31,500
Operations Research Analyst	21,000	22,000	23,000	24,000
Programmer	46,000	16,500	17,000	18,000
Director, Information Services	-0-	10,000	21,000	22,000
Total	$312,000	$334,000	$369,000	$387,000

		Year 1	Year 2	Year 3	Year 4
Clerical					
2 Secretary		$ 24,000	$ 25,000	$ 26,000	$ 28,000
3 Secretary		33,000	34,000	35,000	36,000
4 Clerk/Typist		32,000	34,000	36,000	38,000
	Total	$130,000	$143,000	$158,000	$162,000
Employee Benefits					
Health Insurance		$4,320	$4,910	$7,320	$7,700
Workmen's Compensation		1,040	1,040	1,040	1,040
Unemployment Insurance		1,250	1,250	1,250	1,250
	Total	$6,610	$9,210	$9,610	$10,010

	Year 1	Year 2	Year 3	Year 4
Purchased and Contracted Services				
Professional				
Legal ($100/hr)	$35,000	$37,000	$30,000	$20,000
Consultants ($100/day)				
Project	$6,000	$8,000	$8,000	$ 8,000
Operations	10,000	10,000	5,000	5,000
Engineering	36,300	50,800	30,900	10,900
Evaluation	-0-	3,000	3,000	3,000
Educational Program	45,000	58,000	28,000	9,000
	$97,300	$129,800	$74,900	$35,900
Data Processing	26,000	33,000	24,000	19,500
Other				
Audiovisual Documentation	$ 6,500	$ 12,000	$ 8,000	$ 8,000
Printing	2,000	6,000	2,000	2,000
Duplication, Xerox	4,000	12,000	4,000	4,000
Workshops and Training	17,000	55,000	45,000	38,000
Public Information/Newsletter	4,000	46,000	31,000	37,000
Engineering and Installation	46,860	575,410	2,301,000	-0-
	$80,360	$706,410	$2,391,000	$89,000

	Year 1	Year 2	Year 3	Year 4
Maintenance & Repair				
Vehicles	2,400	2,640	2,900	3,200
Audiovisual Equipment	-0-	100	100	100
Telecommunications Equipment	2,400	283,907	196,400	176,400
Utilities (phone)	15,120	16,632	18,300	20,125
Network Transmission				
Phone (Network)	-0-	31,565	75,756	75,756
Microwave	-0-	87,500	210,000	210,000
Transponder	-0-	75,835	182,004	182,004
Multipoint Distribution	-0-	70,000	168,000	168,000
	$-0-	$264,900	$635,760	$635,760
Rentals				
Office Space	40,500	40,500	44,600	44,600
Site Space	36,000	60,600	98,400	98,400
	$76,500	$101,100	$143,000	$143,000

	Year 1	Year 2	Year 3	Year 4
Supplies and Materials				
Vehicles	$ 200	$ 200	$ 200	$ 200
Office	7,600	6,400	7,000	1,500
Instructional	-0-	3,800	8,200	4,100
Audiovisual	2,000	1,800	2,000	3,000
Operational Computer Software	4,800	2,100	-0-	-0-
Books, periodicals, reference, subscriptions	5,600	5,000	4,000	4,000
	$20,200	$19,300	$21,400	$12,800

	Year 1	Year 2	Year 3	Year 4
Other Operating Expenses				
Travel and Subsistence				
Technical Staff	$ 42,500	$ 52,100	$ 42,500	$34,000
Engineering Staff	1,860	10,770	10,770	8,600
Evaluation Staff	3,000	3,000	8,000	8,000
Operations Staff	6,000	6,000	6,000	6,000
Directors Staff	14,200	21,300	19,200	17,300
Consultants	41,475	56,100	35,175	20,175
	$109,035	$149,270	$121,645	$94,075
Insurance (Property)	37,380	103,580	129,780	129,780
Other	11,800	5,200	3,100	2,500

	Year 1	Year 2	Year 3	Year 4	
Capital Outlay					
Maintenance Vehicles	14,000	-0-	-0-	-0-	
Telecommunications Equipment	1,875,378	3,374,905	1,410,404	6,000	
Audiovisual Equipment	1,100	6,600	5,500	-0-	
	$1,890,478	$3,381,505	$1,415,904	$6,000	
Furniture					
6 Professional work stations	6,960	-0-	-0-	-0-	
9 Professional work stations	7,425	-0-	-0-	-0-	
13 Secretarial	25,792	-0-	-0-	-0-	
	$40,177	$-0-	$-0-	$-0-	
Other (indirect cost)	$2,400	$1,200	$-0-	$-0-	
Total Direct Cost	2,903,376	5,721,762	5,736,821	1,947,212	
Indirect Cost 10.334%	300,035	591,287	592,843	201,225	
Total	$3,203,411	$6,313,049	$6,329,664	$2,148,437	$17,994,561
National Institute of Education	$2,722,899	$4,419,134	$3,164,832	$ 644,531	$10,951,396

APPENDIX I

ALTERNATIVE TECHNOLOGIES: DETAILED COST AND ROUTING ANALYSIS

1. Cost to provide 1-way video and 2-way voice service via full-time, leased Telco facility cost:

   A. Cost for Video Portion

      1. Total intercity network mileage to serve 25 cities (58 service locations) is 2,037 miles. Cost for Type 7001 TV private line service at $52.00 per mile, per month (USOC ILZAW) -

         2,037 miles x $52.00/mile/month — $ 105,924.00

      2. Local (intercity) TV channel--full-time service (USOC ILZA3) 251 total channel miles

         Priced out per city--on detail sheet/month — 82,200.00

      3. TV station connections (USOC VW4) at $1,100.00 connection/month

         58 connections x $1,100.00 — 63,800.00

      4. Total monthly recurring costs for video service (no installation costs involved) — 251,924.00

   B. Cost for Voice Portion

      1. Voice grade II C (intercity mileage) at $3.00/mile/month (USOC 1LPJ4)

         2,037 miles x $3.00 — 6,111.00

      2. Voice Grade Local Loop (intracity) mileage at $3.00/mile/month (USOC 1LP8Y)

         251 miles x $3.00 — 753.00

         Non-recurring cost at $3.50/drop

         58 drops x $3.50 (one-time only) — 203.00

      3. Drop charge--for all drops less first and last at $10.00/drop (USOC 246)

         (58-2) drops x $10.00/month — 560.00

      4. Total non-recurring cost (installation

         Voice network (one-time only) — 203.00

      5. Total monthly recurring cost for voice network portion — 7,424.00

C. Total cost for 1-way video and 2-way voice service via Telco facility only:

1. Total non-recurring charges (one-time only)	200.00
2. Total monthly recurring charges	259,360.00

[illegible] — Attachment 6

[illegible]									
[illegible]	X	X	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	X	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	X	X	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	X	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	X	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	X	X	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	X	X	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	—	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	X	X	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	—	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	X	X	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	—	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	X	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CIRCUIT NOTES.

NOTE 1: USER SITES ARE CODED AS FOLLOWS:

1. TEXAS AGRICULTURAL EXTENSION SERVICE
2. UNIVERSITY OF TEXAS PUBLIC SERVICE CENTER - SAN ANTONIO
3. TEXAS DEPARTMENT MENTAL HEALTH MENTAL RETARDATION
4. REGION XII EDUCATIONAL SERVICE CENTER
5. AMERICAN EDUCATIONAL COMPLEX

NOTE 2: CIRCLED SUPERSCRIPTS INDICATE TOTAL NUMBER OF MULTIPLE DRops FOR A USER. (WITHIN ONE CITY).

NOTE 3: THERE ARE 8 GROSS SITES IN SAN ANTONIO. UTSSC AND PSRC HAVE ONE CONFIRMED SITE.

TTSD NETWORK ALTERNATIVE I

II. Cost to provide 1-way video and 2-way voice service via full-time, leased Telco facility and leased microwave via Texas Telecomputer Grid

A. Cost for Video Portion

1. Total intercity Telco mileage to serve 50 cities is 1,670 miles. Cost for Type 7001 TV private line service, full time, is $52.00/mile/month	
1,670 miles x $52.00	$ 86,840.00
2. Cost for microwave intercity service equivalent to 367 airline miles at $100.00/hour based on 140 hours/month	
140 hours x $100.00	14,000.00
3. TV station full-time connections at $1,100/connection/month (USOC VW4)	
57 connections x $1,100.00	62,700.00
4. Local (intracity) TV channel--full-time service (USOC 1L2AJ) 255 total, local channel miles priced out per city on detail sheet (month)	81,875.00
5. Total monthly recurring costs for video service	245,415.00

NOTE that this does not include any amortized capital expenditure for extending the Texas Telecomputer Grid to Temple and Bryan.

B. Cost for Voice Portion

1. Voice grade IXC (intercity mileage) at $3.00/mile/month (USOC 1LPJ4)	
1,670 miles x $3.00	5,010.00
2. Voice grade local loop (intracity) mileage at $3.00/mile/month (USOC 1LPAY)	
251 miles x $3.00	753.00
non-recurring cost $3.50/channel	
57 drops x $3.50/drop (one-time only)	199.50
3. Drop charge--For all drops less first and last at $10.00/drop (USOC 246)	
(57-2) = 55 drops x $10.00 (monthly)	550.00
4. Total non-recurring cost (installation) voice network (one-time only)	199.50
5. Total monthly recurring cost for voice network portion	6,313.00

C. Total cost for 1-way video and 2-way voice service via Telco facility and microwave

1. Total non-recurring charge (one-time only)	199.50
2. Total monthly recurring charges	251,728.00

SERVICE VIA TELCO AND TEXAS TELECOMPUTER GRID FACILITY - ALTERNATIVE II

SERVICE POINTS	EXISTING CATV SITE	EXISTING ROTV SITE	NUMBER SERVICE SITES	TOTAL TV LOCAL CHANNEL MILEAGE	NUMBER TV CHANNELS CONNECTED	TOTAL TV LOCAL CHANNEL COST	TOTAL TV CHANNEL CONNECTION COST	TOTAL VG LOCAL CHANNEL MILEAGE	TOTAL VG LOCAL CHANNEL COST
			(NOTES 1&2)						
ABILENE	X	X	2,3	6	2	$2,600.	$2,200.	6	$18.
AMARILLO	X	—	1,2,3	12	3	4,500.	3,300.	12	36.
AUSTIN	X	X	1,2,3(5)	36	6	10,200	6,600.	36	108.
BEAUMONT	X	—	2,3,4	12	3	4,500.	3,300.	12	36.
BRENHAM	X	—	3	1	1	800.	1,100.	1	3.
BRYAN (COLLEGE STATION)	X	X	1,4 (NOTE 4)	4	2 (NOTE 5)	2200.	2,200.	4	12.
CORPUS CHRISTI	X	X	1,2(6),3	24	4	6,800.	4,400.	24	72.
DALLAS	—	—	1	8	1	1,875.	1,100.	8	24.
EL PASO	X	X	3	6	1	1,700.	1,100.	6	18.
FT. WORTH	—	—	3	6	1	1,700.	1,100.	6	18.
HARLINGEN	X	X	3	2	1	1,100.	1,100.	2	6.
HOUSTON	—	—	2,3,4	24	3	5,625.	3,300.	24	72.
KERRVILLE	X	—	2(7)3	3	3	2400	3,300.	3	9.

SERVICE POINTS	EXISTING CATV SITE	EXISTING ROTV SITE	NUMBER SERVICE SITES	TOTAL TV LOCAL CHANNEL MILEAGE	NUMBER TV CHANNEL CONNECTIONS	TOTAL TV LOCAL CHANNEL COST	TOTAL TV CHANNEL CONNECTION COST	TOTAL V6 LOCAL CHANNEL MILEAGE	TOTAL V6 LOCAL CHANNEL COST
KILLEEN	X	—	5	0	0(SITES)	$0	$0	0	$0
LAREDO	X	X	2	3	1	1,300.	1,100.	3	9.
LUBBOCK	X	X	1,2,3	16	4	6,000.	4,400.	16	48.
LUFKIN	X	—	3	2	1	1,100	1,100.	2	6.
McALLEN	X	X	2	2	1	1,100.	1,100.	2	6.
NEW BRAUNFELS	X	—	2	1(SITE 1)	1	800.	1,100.	1	3.
SAN ANGELO	X	X	1,2,3	9	3	3,300.	3,300.	9	18.
SAN ANTONIO	—	—	2,3	72	24(SITE B)	16,875.	9,900.	72	216.
TEMPLE	X	—	2	0(NONE)	0	0	0	0	0
UVALDE	X	—	1,2	2	2	1,600.	2,200.	2	6.
VERNON	X	—	1,3	2	2	1,600.	2,200.	2	6.
WESLACO	X	X	1,2	2	2	1,600.	2,200.	2	6.
TOTALS	25 CITIES SERVED		58 SITES 55 SITES	255 MILES LAST MILE	57 TV CONNECTIONS AT TEXCO,	$81,875	$62,700. LAST MILE	255 MILES BY GRID	$756.

CHART NOTES

NOTE 1: USER SITES ARE CODED AS FOLLOWS:

1= TEXAS AGRICULTURAL EXTENSION SERVICE

2= UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER - SAN ANTONIO

3= TEXAS DEPARTMENT MENTAL HEALTH MENTAL RETARDATION

4= REGION IX EDUCATIONAL SERVICE CENTER

5= AMERICAN EDUCATIONAL COMPLEX

NOTE 2: CIRCLED SUPERSCRIPTS INDICATE TOTAL NUMBER OF MULTIPLE SIGHTS FOR A USER WITHIN ONE CITY.

NOTE 3: THERE ARE 8 SERVICE SITES IN SAN ANTONIO. UTHSC AND MHMR HAVE ONE COLOCATED SITE.

NOTE 4: THE PROPOSED TELECOMPUTER GRID EXTENSION TO BRYAN WILL PROVIDE A DROP AT A&M, BUT THE DROP FOR ESCA WILL BE ESTABLISHED VIA TELCO FACILITY.

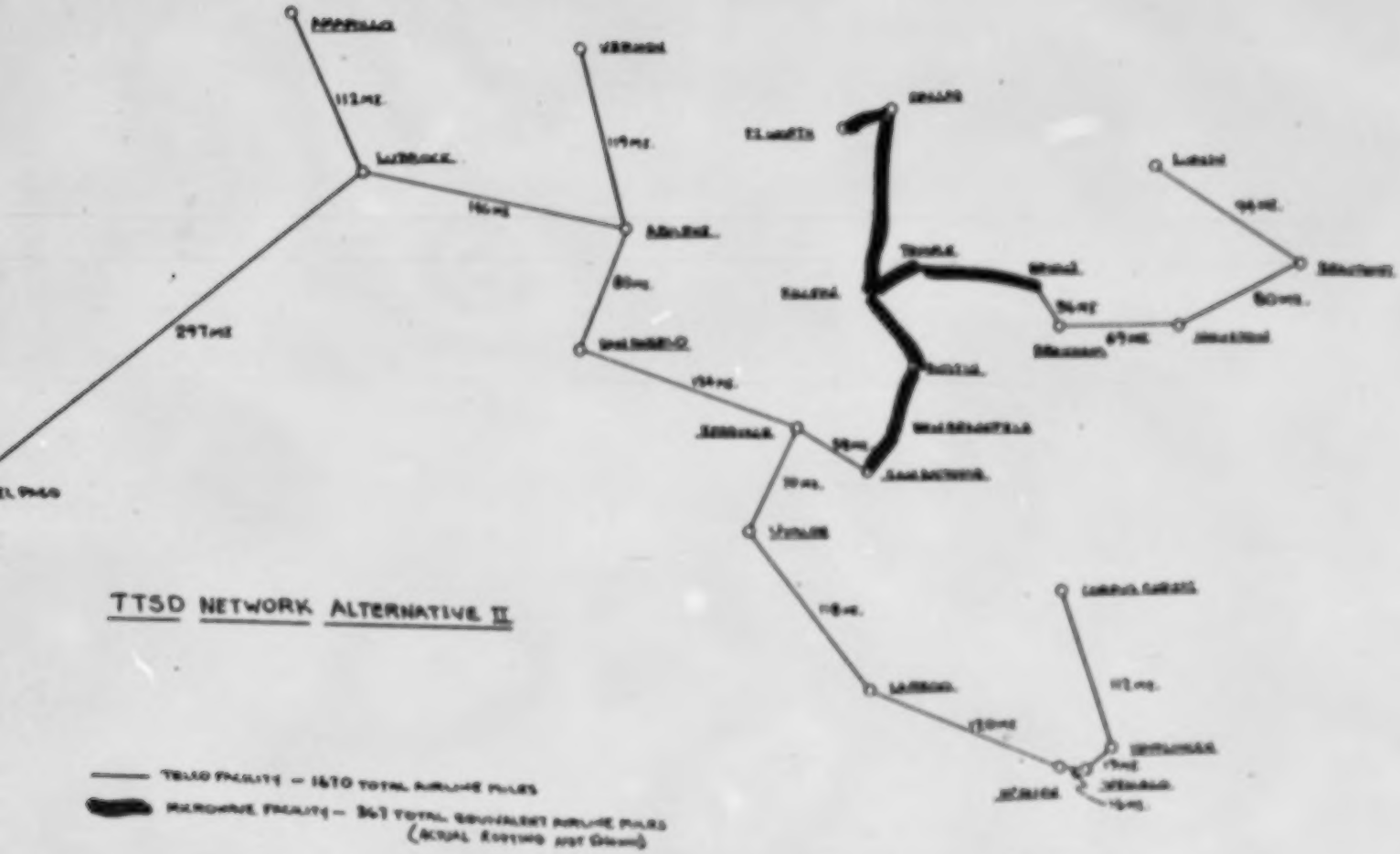
NOTE 5: ONE TV CONNECTION IS REQUIRED AT BRYAN TO JUNCTION WITH TELCO FACILITY TO BRENHAM. TWO MILES OF LOCAL TELCO TV CHANNEL ALSO REQUIRED.

NOTE 6: SERVICE TO AEC AT KILLEEN PROVIDED VIA EXISTING TELECOMPUTER GRID DROP.

NOTE 7: TELCO INTRACITY MILEAGE REQUIRED FROM TELECOMPUTER RELAY SITE TO A&M SERVICE LOCATION.

NOTE 8: ONE TV CONNECTION IS REQUIRED AT SAN ANTONIO TO JUNCTION WITH TELCO FACILITY TO KERRVILLE.

NOTE 9: THE PROPOSED EXTENSION TO THE TELECOMPUTER GRID WILL PROVIDE A DROP AT THE UTHSC TEMPLE LOCATION.



TTSD NETWORK ALTERNATIVE II

III. Cost to provide 1-way video and 2-way voice service via satellite, Telecomputer Grid, and some last mile Telco facility

A. Cost for Telco Last Mile Video

1. No Telco intercity mileage
2. Local (intracity) TV channel mileage--full-time service
   (a) Dallas--1 channel, 8 miles (USOC 1L2AJ) monthly — 1,875.00
   (b) San Antonio--8 channels, 64 miles (USOC 1L2AJ) monthly — 15,000.00
3. TV station connections (USOC VW4) at $1,100/connection/month
   (a) Dallas--1 connection x $1,100.00 — 1,100.00
   (b) San Antonio--8 connections x $1,100.00/connection/month — 8,800.00
4. Total monthly recurring cost Telco video
   (a) Dallas — 2,975.00
   (b) San Antonio — 23,800.00
   (c) Total recurring Telco video — 26,775.00

B. Cost for Telco Last Mile Voice

1. Voice grade IXC (intercity mileage) at $3.00/mile/month (USOC 1LPJ4)
   1,670 miles x $3.00 — 5,010.00
2. Voice grade local loop (intracity) mileage at $3.00/mile/month (USOC 1LPAY)
   251 miles x $3.00 — 753.00
   Non-recurring cost $3.50/channel
   57 drops x $3.50 (one-time only) — 199.50
3. Drop Charge--for all drops less first and last at $10.00/drop (USOC 246)
   (57-2) x $10.00/drop/month — $50.00
4. Total non-recurring cost (installation) voice network (one-time only) — 199.50
5. Total monthly recurring cost for voice network portion — 6,213.00

C. Total cost Telco last mile video and voice

1. Non-recurring Telco costs (one-time only) 199.00
2. Monthly recurring Telco costs 33,000.00

B. Cost for microwave intercity service via Texas Telecomputer Grid at $100.00/hour based on estimated 140 hours/month*

140 hours x $100.00 14,000.00

E. Cost for satellite service - TTSD contracts for 5 hours per day, 7 days per week (4.33 weeks/month) Non-prime time at $100.00/hour

151.67 hours x $100.00 15,167.00

F. Telco non-recurring costs (one-time only) 192.00

G. Total Monthly Recurring Cost: 62,265.00
(Includes grid hourly charge, satellite hourly time and Telco recurring. Does not include any amortized capital expenditure for satellite and microwave plant)

*This rate will be identical to the hourly equivalent rate charged for the Satellite service (Item E). If TTSD uplinks are used exclusively, this rate will decrease to the $50.00/hr. rate charged for Satellite service with customer-furnished up- and downlinks.

ALTERNATIVE III.

SERVICES VIA SATELLITE, TELECONFERENCED GOLD & SOME TELCO LINES ONLY

SERVICE POINTS	EXISTING CMTS SITE	PROPOSED CMTS SITE	SERVICE BITS	FIRST YEAR COST POINTS	TOTAL TV LOCAL ORIGINATION	NUMBER TV CHANNEL CAPABILITY	TOTAL TV EQUIP. CAPITAL COST	TOTAL TELEPHONE EQUIPMENT COST	TOTAL TELEPHONE TO SAT. EQUIP. COST
ABILENE	X	X	2,3	44,896.	—	—	—	—	$18,...
AMARILLO	X	—	1,2,3	44,896.	—	—	—	—	36.
AUSTIN	X	X	1,2,3[2]	42,000	—	—	—	—	108.
BEAUMONT	X	—	2,3,4	65,000	—	—	—	—	36.
BRENHAM	X	—	3	40,000	—	—	—	—	3.
BRYAN/COLLEGE STATION	X	X	1,4	32,882.	—	—	—	—	12.
CORPUS CHRISTI	X	X	1,2[2],3	27,500.	—	—	—		72.
DALLAS	—	—	1	60,000	8	1	$875.	$1,100	24.
EL PASO	X	X	3	27,500	—	—	—	—	18.
FT. WORTH	—	—	3	60,000	—	—	—	—	18.
HARLINGEN	X	X	3	21,978.	—	—	—	—	6.
HOUSTON	—	—	2,3,4	150,000	—	—	—	—	72.
KERRVILLE	X	—	2[2]3	38,896.	—	—	—	—	9.

Service Points	Existing CATV Site	Existing MATV Site	Service Sites	First Cost Per Point	Total TV Local Channel Facilities	Number TV Channels Originating	Total TV Local Channel Cost	Total TV Channel Cost	Total TV Local Channel Cost
Killeen	X	—	5	$17,200	—	—	—	—	0
Laredo	X	X	2	27,500	—	—	—	—	2.
Lubbock	X	X	1, 2, 3	45,516	—	—	—	—	18.
Lufkin	X	—	3	45,000	—	—	—	—	6.
McAllen	X	X	2	(Note 9)	—	—	—	—	6.
New Braunfels	X	X	2	??	—	—	—	—	3.
San Angelo	X	X	1, 2, 3	135,200	—	—	—	—	18
San Antonio	—	—	2, 3 (5)	66,000	64	8	$15,000	$8,800	$216.
Temple	X	—	2		—	—	—	—	0
Uvalde	X	—	1, 2	38,316	—	—	—	—	6.
Vernon	X	—	1, 3	38,316	—	—	—	—	6.
Weslaco	X	X	1, 2	(2 ea)	—	—	—	—	4
Totals	25			$477,996	72 mi	9	4 sets	$7900	$756.

CHART NOTES

NOTE 1: USER SITES ARE CODED AS FOLLOWS:

1 = TEXAS AGRICULTURAL EXTENSION SERVICE

2 = UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER - SAN ANTONIO

3 = TEXAS DEPARTMENT MENTAL HEALTH MENTAL RETARDATION

4 = REGION IV EDUCATIONAL SERVICE CENTER

5 = AMERICAN EDUCATIONAL COMPLEX

NOTE 2: CIRCLED SUPERSCRIPTS INDICATE TOTAL NUMBER OF MULTIPLE SIGHTS FOR A USER WITHIN ONE CITY.

NOTE 3: THERE ARE 8 SERVICE SITES IN SAN ANTONIO. UTHSC AND MHMR HAVE ONE COLOCATED SITE.

NOTE 4: THESE LOCATIONS SERVED VIA VALLEY EAGLE COMPANY. FEED SUBMITS AT HARLINGEN. ALL FIRST COSTS FOR PLANT SHOWN UNDER HARLINGEN SITE.

IV. Cost to provide 1-way video and 2-way voice service via satellite, Telecomputer Grid, TAGER, CATV systems, and MDS facilities with return audio via Telco facility (The Proposed Plan--detailed in Parts IV-VII of the report).

A. Cost for Telco Last Mile Video	$ -0-
B. Cost for Telco return audio--last mile voice	
1. Voice grade 1XC (intercity mileage) at $3.00/mile/month (USOC 1L?J4)	
1,670 miles x $3.00	5,010.00
2. Voice grade local loop (intracity) mileage at $3.00/mile/month (USOC 1LPAY)	
25 miles x $3.00	753.00
3. Drop Charge--For all drops less first and last at $10.00/drop (USOC 246)	
(57-2) x $10.00/drop/month	550.00
4. Total non-recurring cost (installation) voice network (one-time only)	199.50
Total cost Telco last mile audio network, no last mile video (monthly)	6,313.00
C. Cost for microwave intercity service via Texas Telecomputer Grid at $100.00/hour based on 140 hours/month*	14,000.00
D. Cost for MDS intracity service: Dallas, Ft. Worth, Houston, and San Antonio at $25.00/hour based on estimated 140 hours/month	
140 hours x $25.00 x 4	14,000.00
E. Cost for Satellite service--TTSD contracts for 5 hours per day, 7 days per week (4.33 weeks/month) Non-prime time at $100.00/nour	
151.67 hours x $100.00	15,167.00
F. Cost for 1-way video, 2-way voice network with return audio via Telco facility with 1 uplink on Telecomputer Grid (as in Alternates I, II, and III)	
1. Total non-recurring charge (one-time only)	199.50
2. Total monthly recurring charges (for comparison of same services as Alternates I, II, and III)	49,480.00

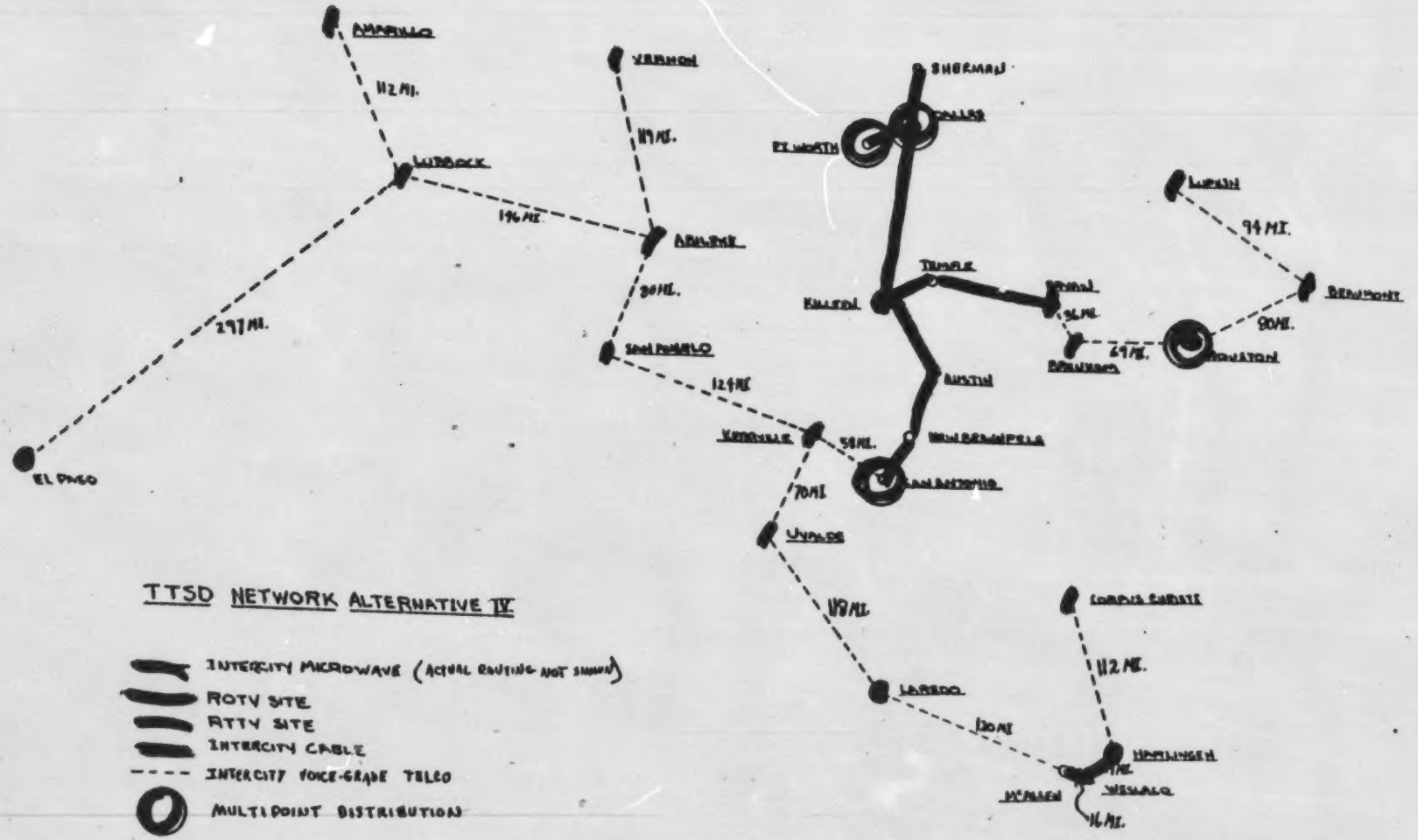
*This rate will be identical to the hourly equivalent rate charged for the Satellite service (Item F). If TTSD uplinks are used exclusively, this rate will decrease to the $50/hr. rate charged for Satlelite service with customer-furnished up- and downlinks.

G. Cost for additional microwave inter/intracity service via TAGER, and to gain access to Rockwell uplink at Collins Radio Facility, Dallas. $25.00/hour (estimate) based on 140 hours/month

140 hours x $25.00 — 3,500.00

H. Total cost for 1-way video, 2-way voice service with return audio via Telco facility; w/two uplinks capable of accessing RCA or Western Union, Telecomputer Grid, TAGER, CATV systems, and MDS facilities:

Total Monthly Recurring Cost — 52,980.00


AMARILLO
112 MI.
LUBBOCK
196 MI.
297 MI.
EL PASO
VERNON
119 MI.
ABILENE
80 MI.
SAN ANGELO
124 MI
SHERMAN
FT WORTH
TEMPLE
KILLEEN
AUSTIN
56 MI.
70 MI
UVALDE
118 MI.
LAREDO
130 MI
LUFKIN
94 MI.
BEAUMONT
90 MI.
29 MI.
112 MI.
HARLINGEN
WESLACO
16 MI.
TTSD NETWORK ALTERNATIVE IV
INTERCITY MICROWAVE (ACTUAL ROUTING NOT SHOWN)
ROTV SITE
RTTV SITE
INTERCITY CABLE
INTERCITY VOICE-GRADE TELCO
MULTIPOINT DISTRIBUTION

S170-D

/03/03 08:21.22

STATE OF TEXAS
TELECOMM PAGE: 1
PTIMAL CIRCUIT ROUTING
SATELLITE DEMONSTRATION NETWRK
(ALL COMMON CARRIER)
PREPARED BY RICK SIDELNIK
AS OF 3-3-78

ODE	V	H	CITY	LINK	CITY	CODE	V	H	MILES
825	9856	3764	MCALLEN	17 ==> 24	WESLACO	1379	9847	3716	16
557	9820	3663	HARLINGEN	10 ==> 24	WESLACO	1379	9847	3716	19
288	9475	3739	CORPUS CHRISTI	06 ==> 10	HARLINGEN	0557	9820	3663	112
717	9681	4099	LAREDO	14 ==> 17	MCALLEN	0825	9856	3764	120
717	9681	4099	LAREDO	14 ==> 22	UVALDE	1335	9357	4279	118
668	9143	4226	KERRVILLE	12 ==> 22	UVALDE	1335	9357	4279	70
668	9143	4226	KERRVILLE	12 ==> 20	SAN ANTONIO	1148	9225	4062	58
919	9145	4018	NEW BRAUNFELS	18 ==> 20	SAN ANTONIO	1148	9225	4062	29
059	9005	3996	AUSTIN	02 ==> 18	NEW BRAUNFELS	0919	9145	4018	45
059	9005	3996	AUSTIN	02 ==> 13	KILLEEN	0671	8832	4063	59
671	8832	4063	KILLEEN	13 ==> 21	TEMPLE	1286	8812	3992	24
177	8827	3788	COLLEGE STATION	05 ==> 21	TEMPLE	1286	8812	3992	65
162	8932	3752	BRENHAM	04 ==> 05	COLLEGE STATION	0177	8827	3788	36
162	8932	3752	BRENHAM	04 ==> 11	HOUSTON	0596	8938	3536	69
992	8777	3344	BEAUMONT	03 ==> 11	HOUSTON	0596	8938	3536	80
992	8777	3344	BEAUMONT	03 ==> 16	LUFKIN	0780	8575	3561	94
555	8479	4122	FORT WORTH	09 ==> 13	KILLEEN	0671	8832	4063	114
022	8436	4034	DALLAS	07 ==> 09	FORT WORTH	0455	8479	4122	31
668	9143	4226	KERRVILLE	12 ==> 19	SAN ANGELO	1147	8944	4563	124
002	8698	4513	ABILENE	00 ==> 19	SAN ANGELO	1147	8944	4563	80
002	8698	4513	ABILENE	00 ==> 23	VERNON	1349	8326	4567	119
002	8698	4513	ABILENE	00 ==> 15	LUBBOCK	0778	8598	4962	146
228	8266	5076	AMARILLO	01 ==> 15	LUBBOCK	0778	8598	4962	112
005	9231	5655	EL PASO	08 ==> 15	LUBBOCK	0778	8598	4962	297

2,037 miles

TOTAL NETWORK MILEAGE = 2037 MI.

APPENDIX II

COMPREHENSIVE STAFF DEVELOPMENT
AND
ADMINISTRATIVE CONFERENCING PROJECT

VIA SATELLITE COMMUNICATIONS SYSTEM

TEXAS AGRICULTURAL EXTENSION SERVICE
THE TEXAS A&M UNIVERSITY SYSTEM

[redacted]

[redacted]

[redacted]

[illegible]

	In Kind $	Grant $	Total
Personnel:			
Production/Operations/Management	$40,000.	$ 75,000	$ 115,000
ZPP Coordinators	15,000.		15,000
Equipment:			
Production Facilities	150,000.		150,000.
**Recruiting Facilities	80,000.		80,000.
Operations/Production:			
ZPP Production	10,000	5,000.	15,000
**FISH Tariff (300 hours)		127,000.	127,000.
TOTALS	$ 315,000	$ 207,000	$ 507,000

* Based on highly tentative estimates of $300./hour for 80 mile two-way exotic. ** Does not include "lean mile" costs that would be subsidized).

[illegible]
The Texas Agricultural Extension Service plans to request start-up costs and additional continuing costs as a budget item in the 1979-80 legislative budget, and if the BIE grant is obtained, to pursue the possibility of outside grant funds that may be available for this type activity.

[illegible]
The conditions of this proposed project are based on the assumption that FISH will be able to provide one-way 80 mile two-way exotic to a location to each of the 15 Extension Districts, and that spreading expenditures would assist keep the number of trucks and personnel. It assumes that FISH would have available for 7-hour breakfast days each week for the 30 or optimal exotic of the Demonstrations spaced approximately 15 days apart. All ZPP exotic would be produced in a 3 1/2 hour format to include any live broadcast time that is required. Demonstrations non-Farmers would be 1 1/2 hours each, noise each exotic.

TABLE OF CONTENTS

GOALS OF PROJECT 1

OBJECTIVES DERIVED FROM THE GOALS 1

I. Comprehensive Staff Development Phase 1-2

II. Administrative Conferencing Phase 2

EXPECTED RESULTS LEADING TO ACHIEVEMENT OF OBJECTIVES 2

I. Comprehensive Staff Development Phase 2-4

II. Administrative Conference Phase 4

ACTIVITIES (MAJOR TASKS) THAT LEAD TO ACHIEVEMENT 4

I. Comprehensive Staff Development Phase 4-5

II. Administrative Conferencing Phase 5-6

TIME LINE FOR MAJOR ACTIVITIES 7

EVALUATION OF EXPECTED RESULTS 8

PERSONNEL ASSIGNED TO PROJECT 9

ESTIMATED COST TO COMPLETE ACTIVITY 10

ASSUMPTIONS FOR OBJECTIVE ACHIEVEMENTS 11

APPENDIX A

APPENDIX B

APPENDIX C-1

APPENDIX C-2

APPENDIX D

COMPREHENSIVE STAFF DEVELOPMENT AND ADMINISTRATIVE CONFERENCING PROJECT
VIA SATELLITE COMMUNICATIONS SYSTEM

TEXAS AGRICULTURAL EXTENSION SERVICE - TEXAS A&M UNIVERSITY SYSTEM

GOALS OF PROJECT

To up-grade the professional competencies of the 1011 staff members of the Texas Agricultural Extension Service in subject matter related to agriculture, home economics, youth development, community development, program development and teaching methods used in informal educational programs offered in 253 of the 254 Texas counties.

To improve the flow of administrative communications between the central administrative staff located at Texas A&M University and the middle management staff headquartered at the 14 District Extension Offices at different points centrally located within each district.

OBJECTIVES DERIVED FROM THE GOALS

The Satellite Telecommunications System will enable the Texas Agricultural Extension Service to accomplish the following objectives with reference to comprehensive staff development and administrative communications as stated in the general goals above:

I. Comprehensive Staff Development Phase

1. To involve approximately 377 County Extension Agents and related subject matter specialists in an intensive in-service training program to up-grade and improve their technical knowledge level in a variety of subjects related to their professional responsibilities in agriculture and related topics.

2. To involve approximately 331 County Extension Agents and related subject matter specialists in an intensive in-service training program to up-grade and improve their technical knowledge level in a variety of subjects related to their professional responsibilities in home economics and related topics.

3. To involve approximately 500 County Extension Agents and related subject matter specialists in an intensive in-service training program to up-grade and improve their technical knowledge level in a variety of subjects related to their professional responsibilities in youth development and related topics.

4. To involve 250 County Extension Agents and related subject matter specialists in an intensive in-service-training program to up-grade and improve their technical knowledge level in a variety of subjects related to their professional responsibilities in community resource development and related topics.

5. To involve approximately 1,000 County Extension Agents and related subject matter specialists in an intensive in-service training program to up-grade and improve their knowledge and skill in program development and teaching methods critical to their effectiveness as professional staff members with the Texas Agricultural Extension Service.

II. Administrative Conferencing Phase

1. To involve the 26 District Extension Agents and the Central Administrative Staff in a system of communication designed to enhance the flow of administrative communications related to organizational operations and management including program and administrative policy, personnel management, budget management, and development of on-going priorities required for effective organizational goal setting and allocation of personnel and other resources.

2. To provide a vehicle for immediate feedback from the field offices on matters which require field data or immediate exchange of information as a condition of decisionmaking involving the central administrative staff.

EXPECTED RESULTS LEADING TO ACHIEVEMENTS OF OBJECTIVES

I. Comprehensive Staff Development Phase

1. Over 80% of the professional staff with responsibility for agricultural programs will significantly increase their subject matter knowledge in 10 to 15 specific subject matter areas essential to the welfare of all farmers and ranchers in Texas.

2. Over 80% of the professional staff with responsibility for home economics programs will significantly increase their subject matter knowledge in 10 to 15 specific subjects related to the welfare of all families in Texas.

3. Over 80% of the professional staff with responsibilities for Community Resource Development will significantly increase their subject matter knowledge essential to the improvement of community organization in selected Texas counties.

4. Over 80% of the professional staff with responsibilities for youth development through 4-H youth work will significantly increase their knowledge in 10 to 15 specific subject matter areas essential to the welfare of Texas rural and urban youth and adult volunteer leaders involved in Extension youth programs.

5. Over 90% of the professional staff with responsibility for program development will significantly increase their knowledge in 5 to 10 subject matter areas related to program development and management as a function of their professional effectiveness.

6. Over 90% of the professional staff will significantly increase their knowledge in 10 to 15 subject matter areas related to teaching methods and procedures used in informal teaching situations with adult audiences in agriculture, home economics, resource development, youth and related areas.

7. The comprehensive staff development program via satellite will provide a uniform quality of in-service training offered on a state-wide basis not currently possible, and at a cost significantly less than that of other alternative methods available to the Texas Agricultural Extension Service (See Appendix A for full cost-saving analysis).

8. The comprehensive staff development project will significantly extend the expertise of the state-level subject matter specialists, making it possible for them to train virtually all field staff in subject matters related to their area of responsibility. This will enhance the professional competencies of the field staff and significantly increase the utilization of state level personnel in the staff training function.

9. The staff development project will increase the use of already existing technical equipment and personnel in our instructional television and broadcast section with viewing equipment located at each District Extension office.

II. Administrative Conference Phase

1. The ability to communicate with District Extension Agents representing middle management in the operations and management of a state-wide agency will encourage uniform application of policy, decrease amount of time needed to make major operational and managerial decisions in matters related to personnel management, budget and related areas essential to organizational development and operations.

2. Many organizational decisions depend upon the ability to secure data from the field staff to be incorporated into state-wide priorities. The administrative conference phase of the project will significantly decrease the time required to obtain and transmit this type of information.

3. Many state-wide emergencies in the areas of animal health, human health and natural disasters require the immediate response of county Extension staff in rural areas. The ability to communicate state-wide with District Extension Agents on such matters could result in effective action on the part of county staff with resulting savings in both human suffering and money.

ACTIVITIES (MAJOR TASKS) THAT LEAD TO ACHIEVEMENT OF EXPECTED RESULTS

I. Comprehensive Staff Development Phase

1. County Extension Staff and related subject matter specialists will be involved through both interview and survey methods to determine more precisely the subject matter areas in agriculture, home economics, community development, youth development, program development and teaching methods to be offered during the intensive in-service training program via satellite communications system to

the 14 or more viewing locations throughout the state. (See Appendix B).

2. The training needs, as determined, will be placed in priority of importance in terms of the overall goals to be achieved by the Demonstration and scheduled into the broadcast time required for conducting the staff training phase of the project.

3. Individual instructors will be identified for each instructional television unit to be included in the comprehensive staff development phase of the project and to provide adequate orientation and training on how to teach effectively via television with two-way audio capabilities.

4. Procedures for the development and production of the 78 individual 3 1/2 hour ITV units will be developed with appropriate schedules to meet the requirements of the overall Telecommunications Demonstration.

5. Viewing schedules and locations will be announced to the county staff and related specialist staff for each ITV broadcast.

6. Appropriate supplemental printed materials will be sent to each viewing location to be used by the viewing site coordinator.

7. Specific evaluation procedures will be used pre-, during and post production of all ITV units to assure that production standards are maintained at an acceptable level.

8. Post viewing evaluation to estimate the immediate change in knowledge level and how the learners responded to the quality of the ITV unit and method of instruction.

II. Administrative Conferencing Phase

1. The 26 District Extension Agents representing middle management and the Central Administrative staff will be involved in an administrative staff conference twice each month to enhance the flow of administrative communications concerning all phases of the state-wide organization.

2. Agenda items will center on matters related to personnel, program priorities, scheduling, areas of joint decisionmaking, information needed from the field staff for managerial decisions, and all aspects of operations and management.

3. Agenda items and necessary background materials will be sent to District Agents or received from them prior to each administrative conference which will be scheduled for 1 1/2 hours twice each month.

4. Procedures for initiating an emergency administrative conference involving the 26 District Agents and central administrative staff will be worked out within the operational management of the satellite communications system.

	Pre-Proposal	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25-48
Needs Assessment	X	X	X	X	X	X																					
Needs Priority Determined		X	X	X	X																						
Individual Instructors Identified		X	X	X																							
Pre-Production Procedures Developed		X	X	X																							
Production of ITV Units			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Supplemental Materials Produced			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Viewing Site Coordinators Identified		X	X	X	X	X	X	X	X	X																	
Viewing Sites Located and Schedule Announced			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Evaluation Procedures Determined and Applied	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Administrative Conferencing Agenda Developed		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Background Materials Developed for Administrative Conference			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EVALUATION OF EXPECTED RESULTS

1. Activities	2. Instruments and/or Procedures
I. Comprehensive Staff Development & Administrative Conference Phase	
A. Quality of ITV Productions Monitored	Objectives stated in behavioral terms.
	Criteria for visualization stated in specific terms.
	Pre-test on sample audience for reaction to presentation and content for first 5 productions.
B. Behavioral Change Determined	Standard comprehension test administered for immediate recall. (Pre-post design with viewing sites selected randomly).
	Standard attitude assessment to determine learner attitude towards the ITV approach to comprehensive staff development programs.
C. Organizational Goals Achieved	Percent of staff receiving staff development pre-post project.
	Observations of District Agents on abilities of staff in areas of training pre-post comprehensive staff development project.
	Pre-post measures of amount of time specialists spent on field staff training.
	Pre-post measures of specialist's attitude toward staff development responsibilities.
D. Administrative Communications Delivered	Documentation of amount and type of administrative communications delivered via project.
	Estimate of decision time required for administrative decisions pre-satellite vs satellite system.
	Standard assessment of middle management's attitude towards the administrative Conferencing technique as compared to other methods.
	Assessment of the amount of time and costs saved by the satellite system as compared to present methods of having District Agents travel to College Station.

PERSONNEL ASSIGNED TO PROJECT

Overall Project Leader - Dr. William Tedrick, Editor and Head of Department of Agricultural Communications, will have responsibility for the overall administration and management of the project development, implementation and management during the term of the activity, and represent the Texas Agricultural Extension Service on the Consortium.

Production and Operations Manager - Mr. James F. Whitman, Project Leader for Broadcast Services, will have responsibility for the operations and management of the television production required for the project and appropriate interface with the Telecommunications Satellite System. Other production staff will be identified as required to handle the requirements of the project. Mr. Whitman will represent the Extension Service on the Technical Operations Committee as part of the Consortium Management Team.

Instructors - Competent subject matter instructors will be identified from the ranks of specialists in agriculture, home economics, community resource development, youth development, program development and teaching methods areas. These instructors, for the most part, will be recognized experts in their respective subject areas with doctoral level training. It is anticipated that from 40 to 50 different instructors will be responsible for developing one or more ITV units for the project.

Administrative Supervision - All personnel assigned to the project will be under the immediate supervision of their respective administrative supervisor who serves as a member of the central administration staff for the state-wide agency. They will have the full authority and responsibility to commit the personnel and supporting resources to the project as outlined in this proposal.

A Summary Resume of the principal staff to be involved can be found in Appendix D.

ESTIMATED COST TO COMPLETE ACTIVITY
(Based on 4-Year Demonstration)

	In-Kind $	Grant $	Total
Personnel:			
Project Manager (48 mos.)	$ 44,000	$ 5,000	$ 49,000
Production & Operational Manager (48 mos.)	48,000	$ 20,000	68,000
Production Assistants (48 mos.)	24,000	24,000	48,000
Engineering Assistants (48 mos.)	24,000	24,000	48,000
Administrative Supervisors - (48 mos.)	24,000		24,000
ITV Instructor Costs (3 days/Unit @ $100./day) 78-3 1/2 hour ITV Units	23,400		23,400
Equipment: /2			
TV Production Facilities, Updating, 4 year total	150,000		150,000
Viewing & Audio Facilities at 14 Locations	80,000		80,000
Operations/Productions: /1			
Film, tape, set production, etc. for 78-3 1/2 hour ITV Units	25,000	5,000	30,000
TOTALS	$ 372,400	$ 78,000 /1	$ 450,400 /1

/1 Does not include an estimated $117,000 in tariff cost for the use of the satellite system for 390 hours over the 39 months of operation during the Demonstration.

/2 See Appendix C-1 & C-2

ASSUMPTIONS FOR OBJECTIVE ASSESSMENTS

Basic assumptions concerning operational plans for the Texas Telecommunications Satellite Demonstration:

System will provide one-way video, two-way audio to and from the 15 Texas Bus Office terminals as indicated on Chart 1.

These terminal locations will deliver a signal to 15 districts, but not necessarily to the District Office location. Approximate locations are indicated on Chart 2.

The Extension Service Project within the Demonstration would be as outlined in the Comprehensive Staff Development Document provided earlier.

We would request 10 hours of broadcast time per month for the duration of the project.

The first broadcast will be during the 10th month after the project is funded by NSF.

Extension would have 2 five hour broadcast days per month spaced approximately 10 days apart.

The broadcast day would include 1 1/2 hours (9:30-11:30 a.m.) to accommodate conference time.

The remainder (3 1/2 hours) would be devoted to instructional television programming each broadcast day.

Broadcast days would be dedicated to specific audiences (i.e. Agriculture, Home Ec., CRD, 4-H) so that educational units can be produced to fit audience type.

All production will be done in the Department of Agricultural Communications facilities which will be up-graded to produce broadcast quality materials.

ITV units will be produced within the basic 3 1/2 hour format with all elements pre-recorded if appropriate to the content.

All ITV units will be reviewed and pre-recorded at least 2 months prior to the broadcast month it is scheduled to run.

Viewing site coordinators will be identified for each ITV unit and given appropriate orientation as to their role when the ITV unit is broadcast at each viewing site scheduled for the program.

All ITV units will be produced with the criteria as suggested in Chart 3 in mind.

APPENDIX A

COST BENEFIT ANALYSIS: COMMUNICATIONS SATELLITE SYSTEM VERSUS TRADITIONAL FACE-TO-FACE INSTRUCTIONAL FORMAT

The development of a state-wide telecommunications system via satellite makes it practical to establish a viewing location at a central location in each of the 15 Extension Service Districts. This communications system will make it possible to communicate via two-way video and two-way audio from Texas A&M University to each viewing location in the districts.

This system makes it feasible to offer in-service training to the entire field and area headquarters staff at one time, thus offering the opportunity to extend significantly the enjoyment of available instructional personnel and provide uniform quality of instruction to all staff members regardless of the remoteness of their office location.

It is proposed that a series of 10 five hour ITV broadcasts be scheduled over a 10 month period. This period coincides with the duration of the Texas Telecommunications Satellite Demonstration now under funding request to the National Institute of Education.

The purpose of this analysis is to document the potential cost savings that can be realized by offering these 10 in-service training sessions via the Communications Satellite System as compared to traditional methods available to the agency.

It is assumed that the agency could offer the equivalent amount of training in two other ways; (1) a series of 10 one-point, one-day district meetings to which the instructor would travel and present the subject matter under face-to-face conditions, or (2) having the entire field staff attend a series of 10 four-day state conferences which would provide approximately the same amount of training time.

This analysis attempts to estimate the cost of travel and per diem required for assembling the county field staff under the three alternative methods, and reflect the instructor costs (mileage, per diem and staff time) required for each method. These costs are reflected in Table 1.

Per diem and mileage costs for assembling the county field staff at a central point in each district was computed by determining the average mileage between a central point within the district and each county seat town.

This resulted in an average figure of 120 round-trip miles per county on a state wide basis. It was further assumed that each county would send one car per meeting and that an average of $10 per staff person would be required to handle meal costs in lieu of per diem. The result of this analysis is reflected as the total cost for field staff for the ETV and District Meeting methods in Table 1.

The cost for per diem and mileage for the state-wide conference was computed by determining the approximate average mileage traveled by each county from each district, based on mileage from College Station to the County Seat town in each county; plus an estimated per diem based on the average distance traveled from each district. These data are given in Table 2. This computation reveals that the average mileage and per diem costs per staff person is about $50.00 just to assemble the entire county field staff at College Station and return them to their headquarters office. The per diem for the actual conference time and programming costs are in addition to the assembly costs and are $30.00 per staff person per day. Table 1 estimates that it would cost about $2,719,280 to conduct 20 state-wide conferences at College Station, not including the cost of providing the training and instructors' staff time.

Based on this analysis, it appears that by using the Telecommunications Satellite system, that a total of 78 five hour in-service training sessions could be conducted at the district level for all 805 field staff at a total cost of $1,069,792 in mileage and per diem costs including charges for instructor staff time.

The face-to-face teaching method where the instructor would attend a 5 hour district level meeting would cost $1,403,064 including charges for instructors staff time devoted to the teaching assignments.

The practicability of holding 20 state-wide conferences is questionable, and certainly doesn't seem to be economically feasiable as indicated by the total overall costs of well over $2 million shown in Table 1.

Potential Net Cost Savings Realized

Assuming that the cost of preparation for teaching either by face-to-face or ETV is similar, and assuming that the per hour costs for using the Telecommunications system is $300, the estimated net cost savings would be $4,324.00 minus $1,500.00 or $2,824.00 per five hour training session. This would total to $220,272 over the entire series of 78 sessions during the 39 month period.

Even if substantially larger ETV production costs were assumed and the operational costs of the system were increased to much higher per hour rates, the overall savings would be significant. However, the more important fact remains that if the Satellite Communications System were not available, it is highly unlikely that this commitment to comprehensive staff development would be realized on a face-to-face district meeting format at the level proposed in this demonstrational program.

TABLE 1 - Comparison of per diem, mileage and instructor cost when offering 78 five hour in-service training sessions by Educational TV via satellite, one point district meetings and 20 state-wide 4 day Staff Conferences to 805 County Extension Agents - Texas 1978 (253 Counties).

	78 ETV Broadcast/1	78 District Meetings	20 State-Wide Conferences
805 Field Staff/2	$1,057,992	$1,057,992	$2,719,280
78 Instructors	7,800/5	345,072	7,800/5
Total	$1,065,792	$1,403,064/3	$2,727,080/4

/1 assumes that a central viewing point in each District would serve for both ETV or District meeting location.

/2 assumes that each county would send one vehicle and $10/day per diem for 805 staff, plus average 116 miles per car.

/3 assumes that 78 instructors would require 23 days each to conduct 78 sessions at district level over 39 months. Includes per diem and 23 days at $100 per instructor.

/4 assumes that 20 four-day state-wide conferences would be required to provide equivalent training time to 78 one-day meeting at District level.

/5 no per diem required.

NOTE: Per diem and mileage costs are based on the instructor making 5 week long trips to cover the 14 district meetings in this order:

Trip #1 - College station/Amarillo/Lubbock/Vernon/College Station
Trip #2 - College Station/Fort Stockton/San Angelo/Stephenville/College Station
Trip #3 - College Station/Uvalde/Weslaco/Corpus Christi/College Station
Trip #4 - College Station/Dallas/Overton/Nacogdoches/College Station
Trip #5 - College Station/Beaumont/Bastrop/College Station

Cost per instructor is:

	Mileage - $708	
	Per Diem $660	
	$2124	per series of 14 meetings
23 days @ $100.00 =	$2300	staff time charges
	$4424	

It was assumed that ETV and State-wide Conferences would not require per diem or travel costs by the instructors.

TABLE 2 - Summary of average mileage and per diem costs required to assemble Extension County Field Staff at College Station for State-Wide Conference

District	No. Counties	No. Staff	Avg. Miles Round-Trip to College Station	Cost per Mile	Estimated Vehicles per District	Mileage Cost	Per Diem Per Day	Per Diem Per Day	Total Per Diem Cost	Total Cost
1	20	49	1008	.18	12	$2177.	1.5	$30.	$2205	$4382
2	20	61	876	.18	15	2365	1.5	30	2745	5110
3	21	49	676	.18	12	1460	1.5	30	2205	3665
4	18	79	396	.18	18	1283	1.0	30	2370	3653
5	19	71	406	.18	15	1096	1.0	30	2130	3226
6	22	57	904	.18	12	1952	1.5	30	2565	4517
7	17	45	532	.18	10	957	1.0	30	1350	2307
8	18	53	312	.18	12	674	.75	30	1219	1893
9	19	57	240	.18	14	604	.50	30	855	1459
10	17	70	168	.18	18	544	.50	30	1050	1594
11	16	87	192	.18	24	829	.50	30	1305	2134
12	11	28	624	.18	7	786	.75	30	644	1430
13	19	46	480	.18	11	950	.75	30	1058	2008
14	16	53	328	.18	13	767	.75	30	1219	1986
Totals	253	805				$16,444			$22,920	$39,364

Average $49.00 per staff member for travel cost to State-wide Conference at College Station.

TABLE 3 - Summary of Average Mileage and Per Diem costs required to assemble Extension County Field Staff at central location within each Extension District, Texas 1978

District	No. Counties	No. Staff	Avg. Miles Round-Trip To Central Point	Cost/ Mile Cents	Mileage Costs	Per Diem/1	Total Costs
1	20	49	110	.18	$ 396.	$ 490.	$ 886.
2	20	61	110	.18	396.	610.	1,006.
3	21	49	112	.18	423.	490.	913.
4	18	79	106	.18	343.	790.	1,133.
5	19	71	88	.18	301.	710.	1,011.
6	22	57	210	.18	832.	570.	1,402.
7	17	45	120	.18	367.	450.	817.
8	18	53	104	.18	337.	530.	867.
9	19	57	118	.18	404.	570.	974.
10	17	70	108	.18	330.	700.	1,030.
11	16	87	118	.18	340.	870	1,210.
12	11	28	128	.18	276.	280.	556.
13	19	46	134	.18	458.	460.	918.
14	16	53	108	.18	311.	530.	841.
Totals	253	805			$5,514.	$8,050.	$13,564.

/1 assumes a flat rate average of $10.00 per staff person.

APPENDIX B

LOCATIONS OF DOWN SITES (DISTRICT OFFICES)

District 1	Agricultural Research and Extension Center 6500 Amarillo Blvd., West Amarillo, Texas 79106
District 2	Agricultural Research and Extension Center Route 3, Box 213AA Highway 87 North Lubbock, Texas 79401
District 3	New Research and Extension Center Box 2159 Vernon, Texas 76384
District 4	Research and Extension Center at Dallas 17360 Coit Road Dallas, Texas 75252
District 5&9	Agricultural Research and Extension Center Drawer 38 Overton, Texas 75684
District 6	Agricultural Extension Service 1710 North Front Street, Apache Plaza Fort Stockton, Texas 79735
District 7	Research and Extension Center Route 1, Box 950 Big Spring Highway San Angelo, Texas 76901
District 8	Agricultural Extension Service Box 1177 US 281 at Intersection of FM 8 Stephenville, Texas 76401
Districts 10&11	Agricultural Extension Service 301 North Main Bryan, Texas 77801
District 12	Agricultural Research and Extension Center 2401 East Highway 83 Weslaco, Texas 78596
District 13	Research and Extension Center P. O. Drawer 1849 Garner Field Road Uvalde, Texas 78801
District 14	Research and Extension Center P. O. Box 10608 Highway 44 Corpus Christi, Texas 78410

APPENDIX C-1

EQUIPMENT AT OUR STUDIO

Cameras: Two each RCA PK-730 cameras converted for monochrome operation.

Film Chain: RCA PFS-710 converted to monochrome operation.

Sync Generator: RCA PSG-2, EIA standard RS-170, monochrome.

Video Switcher: Dynair VS-121B.

Video Special Effects: Dynair Mini-Split, SE-260A.

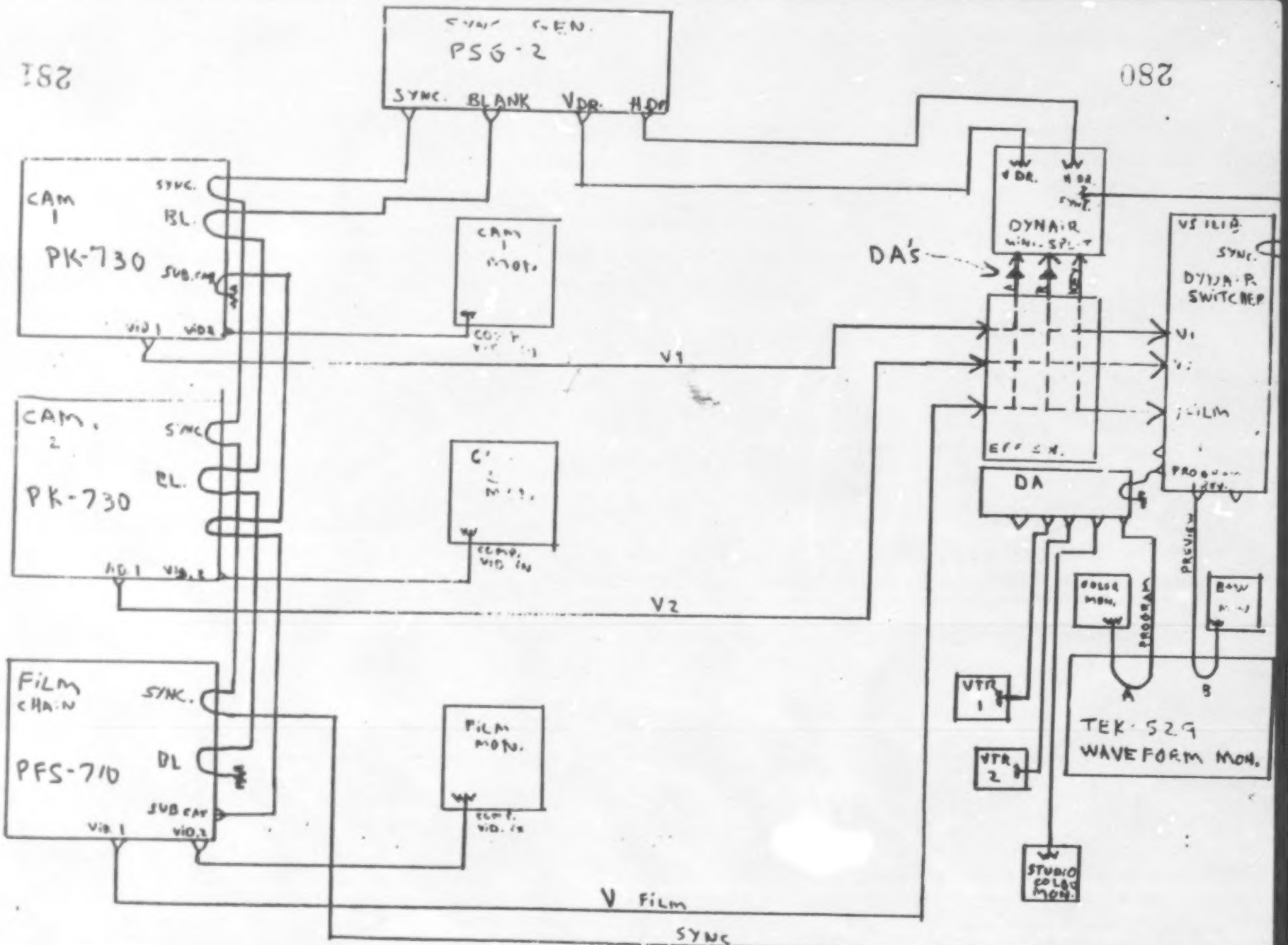
Video Recorders: One Sony VO-1600, One Sony VO-2850 (on order), Two IVC 860.

Waveform Monitor: Tektronix RM529.

Audio Mixer: RCA Remote mixer, BN-17A

Studio Space: 14 x 33 feet.

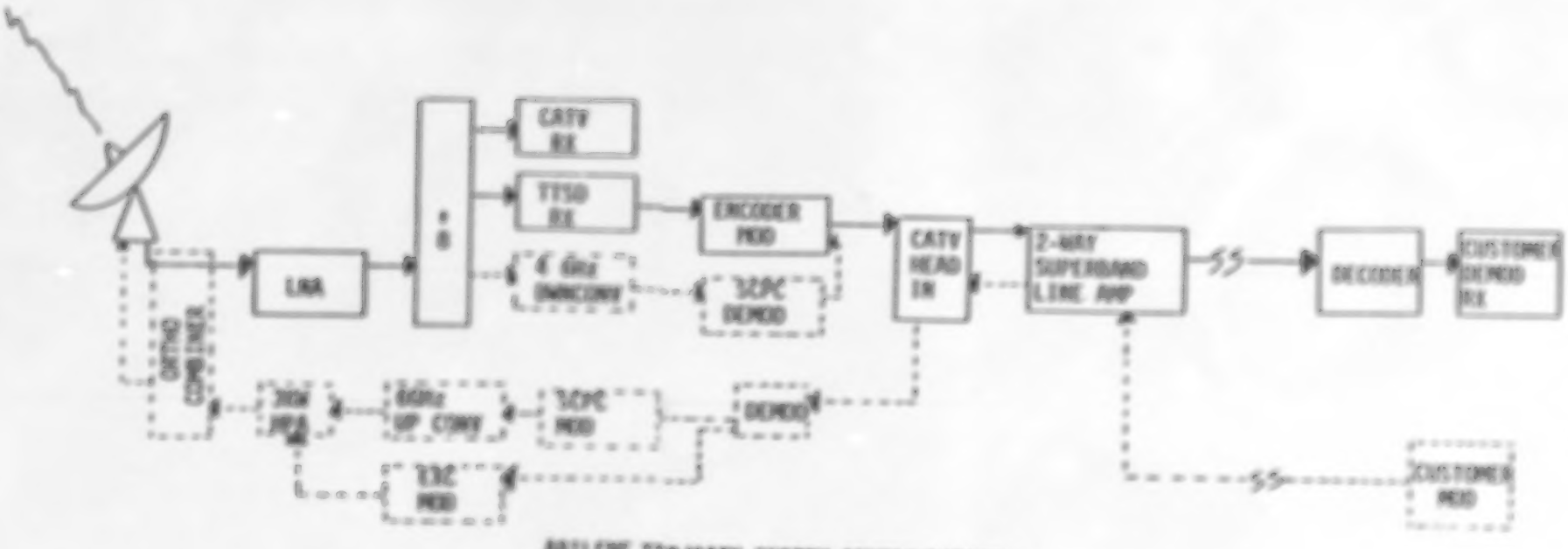
Equipment at District 12 Offices: One Soney VO-1600 Recorder and Two 17 inch color TV sets.


SYNC GEN.
PSG-2
SYNC. BLANK VDR. HDR
CAM 1
PK-730
SYNC.
BL.
SUB CAR
VID 1 VID 2
CAM 1 MON.
V1
CAM 2
PK-730
SYNC
BL.
VID 1 VID 2
C' MON.
V2
FILM CHAIN
PFS-710
SYNC.
DL
SUB CAR
VID 1 VID 2
FILM MON.
V FILM
SYNC
DA'S
VDR.
HDR
DYNA-R
DYNA-R SWITCHER
V1
V2
FILM
EFF'S M.
DA
PROGRAM
PREVIEW
COLOR MON.
B&W MON.
VTR 1
VTR 2
TEK-529
WAVEFORM MON.
STUDIO COLOR MON.

APPENDIX III

HARDWARE CONFIGURATIONS, CIRCUITRY, AND COSTS BY TTSD SITE

PHASE II - A SITES



ABILENE TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

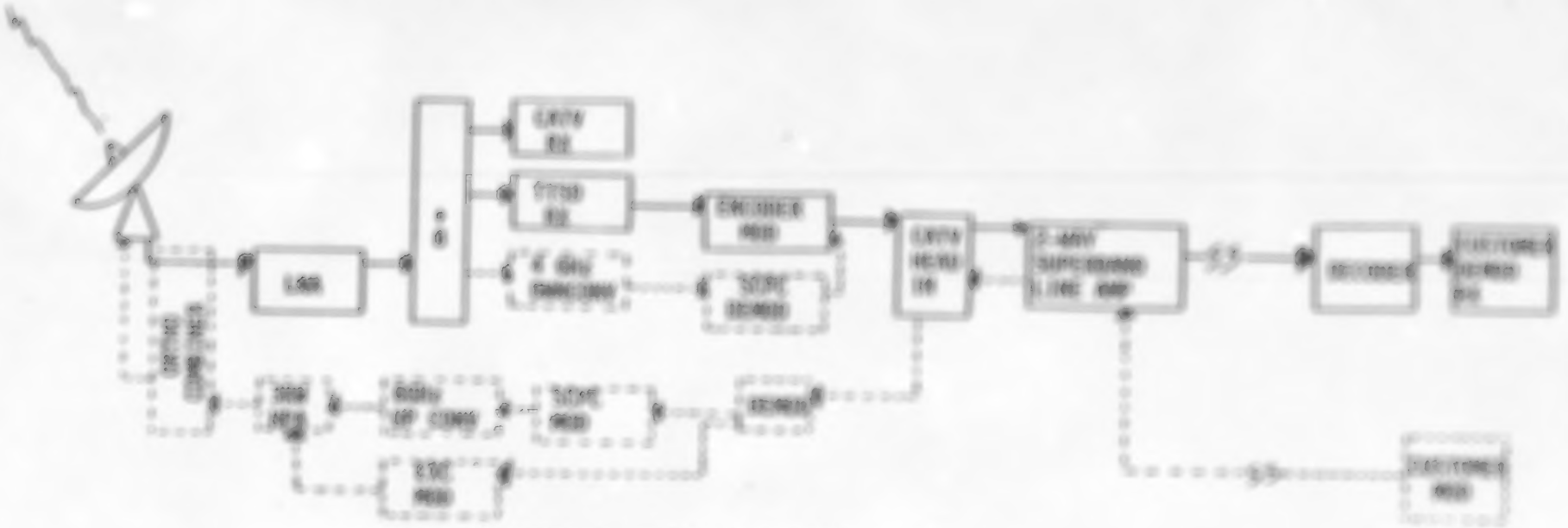
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modifications	$31,216
3.	Engineering and Installation	$ 5,100
	TOTAL	$44,816

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modifications	$ 6,264
3.	Engineering and Installation	$ 5,100
	TOTAL	$62,127

ABILENE



[illegible] TT&C/DATA SYSTEM CONFIGURATION

[illegible] LINE - BASIC TT&C SYSTEM

BASIC SYSTEM COST

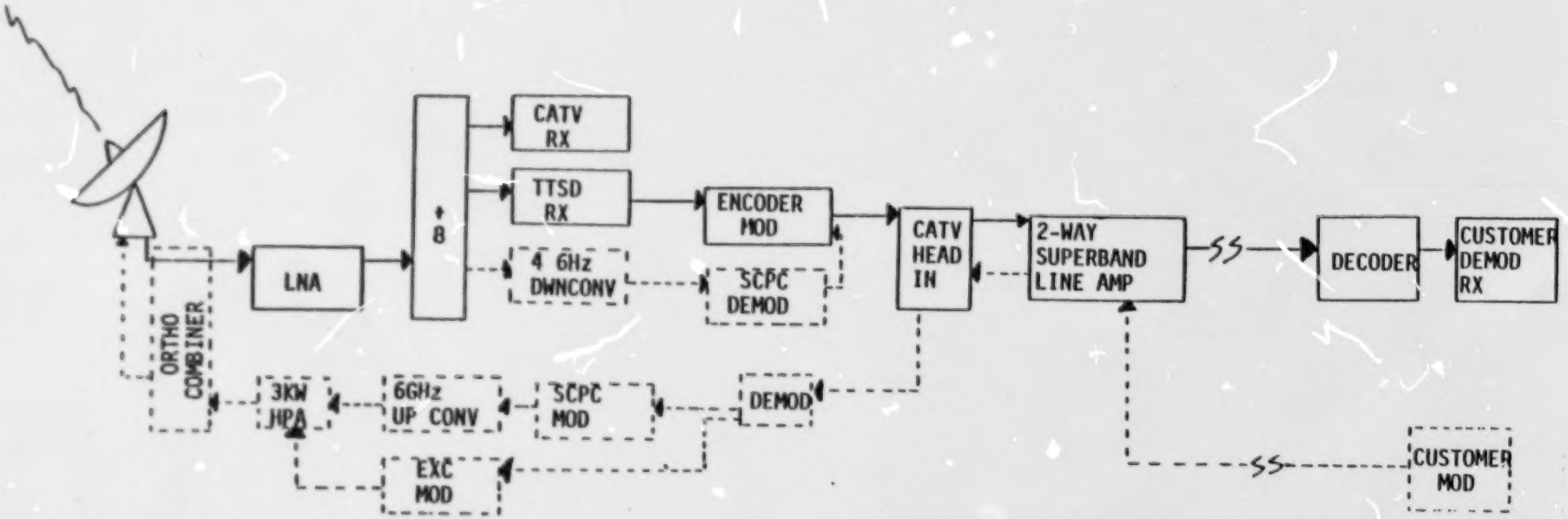
1.	Equipment	$ 0,000
2.	Cable System Modification	00,000
3.	Engineering and Installation	0,000
	TOTAL	$00,000

[illegible] LINE - ENHANCED S-BAND TT&C SYSTEM

ENHANCED SYSTEM COST

1.	Equipment	000,000
2.	Cable System Modification	0,000
3.	Engineering and Installation	0,000
	TOTAL	000,000

[illegible]



AUSTIN TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

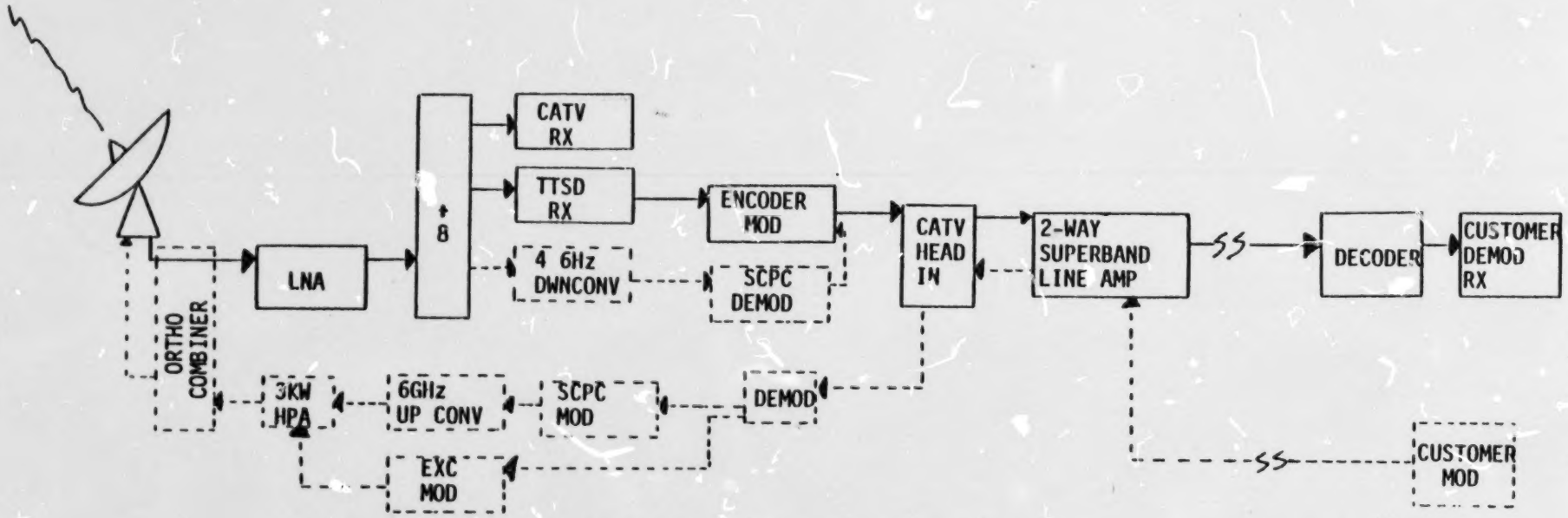
DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

BASIC SYSTEM COST

1.	Equipment	$11,500
2.	Cable System Modifications	$26,500
3.	Engineering and Installation	$ 4,000
	TOTAL	$52,000

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modifications	$ 3,632
3.	Engineering and Installation	$ 4,000
	TOTAL	$58,395



BEAUMONT TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

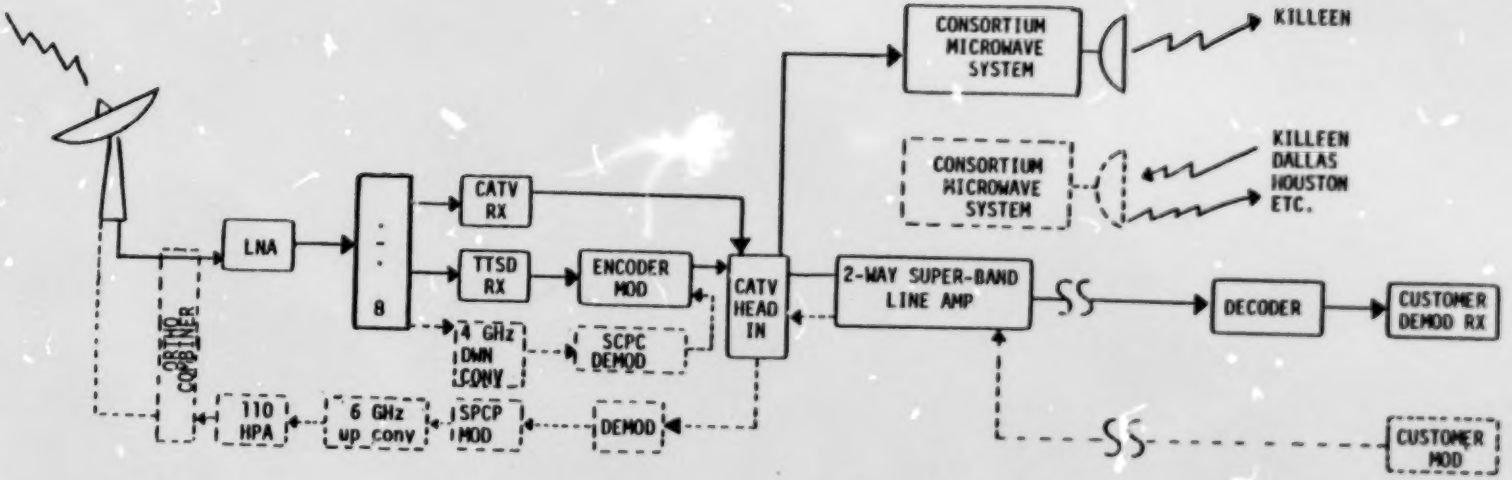
DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modifications	$49,000
3.	Engineering and Installation	$ 8,000
	TOTAL	$65,500

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modifications	$ 4,948
3.	Engineering and Installation	$ 8,000
	TOTAL	$63,711



COLLEGE STATION TTSD/CATV SYSTEM CONFIGURATION

Solid Line = Basic TTSD System

Dashed Line - Expanded 2-Way TTSD System

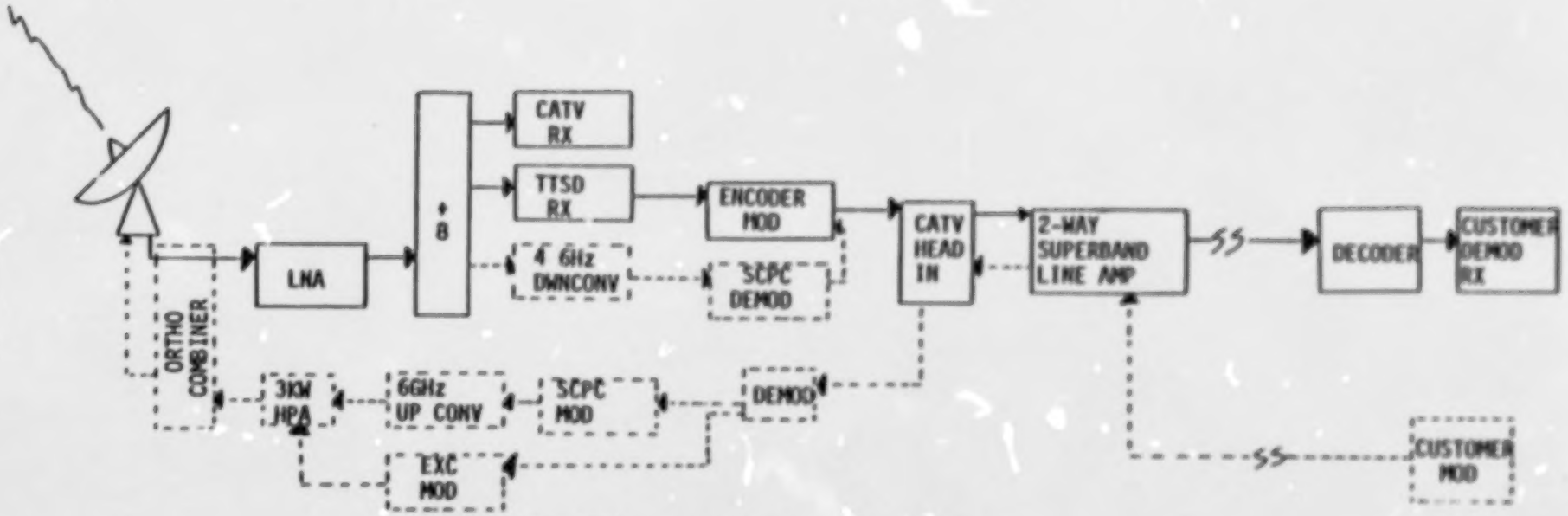
Basic System Cost

1. Equipment	8,500
2. Cable System	21,450
3. Engineering and Installation	4,000
	$33,950

Expanded System Cost

1. Equipment	$60,263
2. Engineering and Installation	4,000
	$64,263

COLLEGE STATION



CORPUS CHRISTI TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

BASIC SYSTEM COST

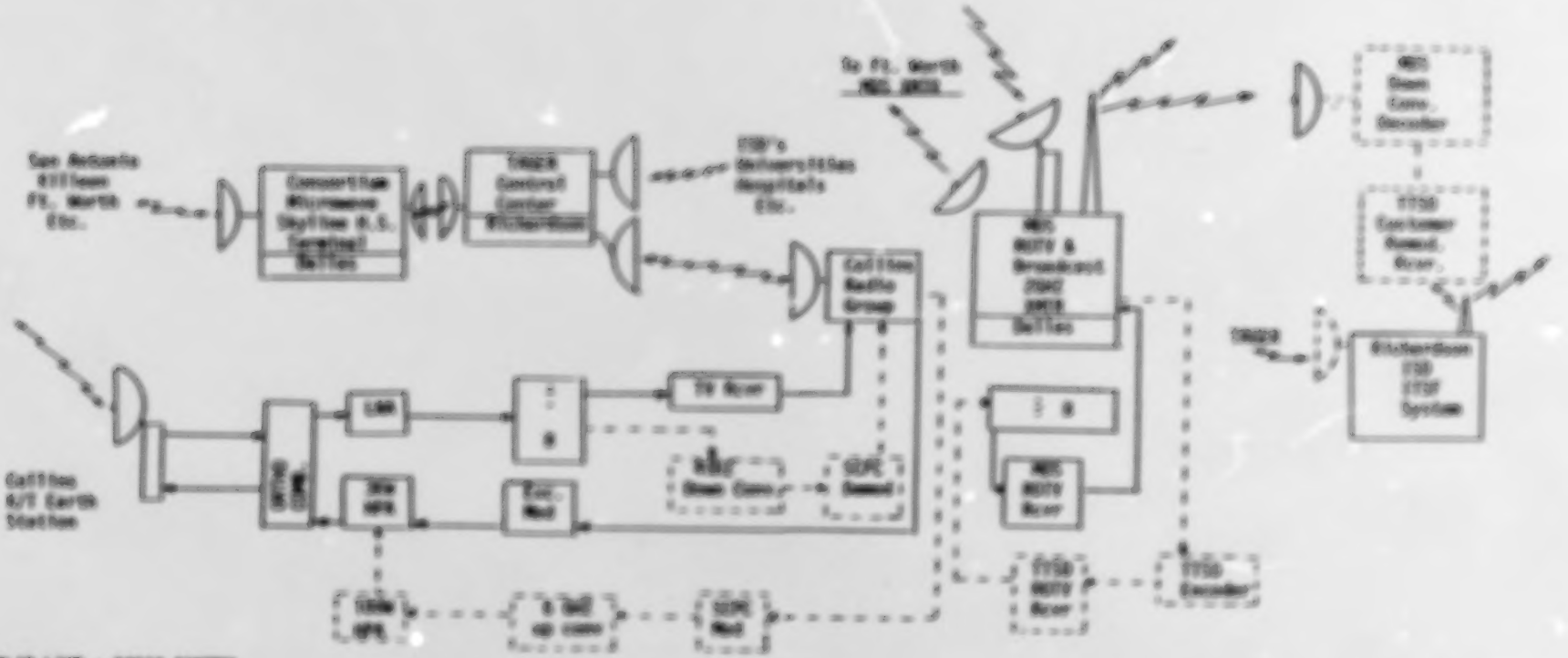
1.	Equipment	$ 8,500
2.	Cable System Modifications	$15,000
3.	Engineering and Installation	$ 4,000
	TOTAL	$27,500

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modifications	$ 6,264
3.	Engineering and Installation	$ 4,000
	TOTAL	$60,027

CORPUS CHRISTI



SOLID LINE = BASIC SYSTEM

DASHED LINE = EXPANDED SYSTEM

DALLAS TTSS/MDS/INDEX SYSTEM CONFIGURATION

Basic System Cost

1. 2 1-dup microwave	110,000
2. Engineering and Installation	20,000
	$130,000

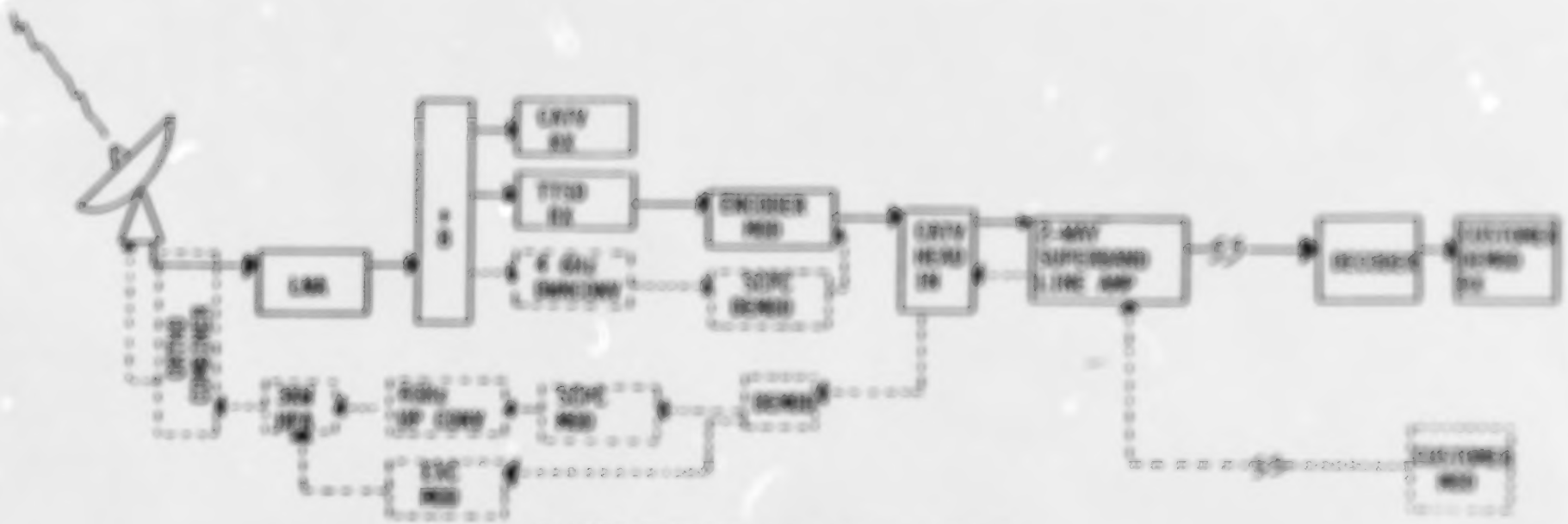
Expanded System Cost

1. 2 1-dup microwave systems	110,000
2. Equipment	79,195
3. Engineering & Installation	10,000
	$ 207,195

DALLAS

215

216



EL PASO TITAN/CATV SYSTEM CONFIGURATION

SOLID LINE = BASIC TITAN SYSTEM

BASIC SYSTEM COST

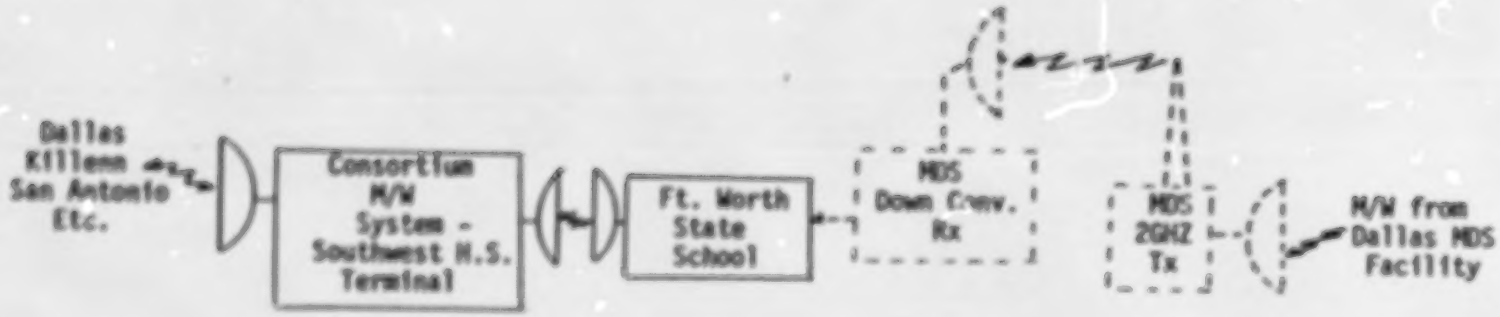
1.	Equipment	$ 9,500
2.	Cable System Modifications	$10,000
3.	Engineering and Installation	$ 6,000
	TOTAL	$27,500

DASHED LINE = EXPANDED 2-WAY TITAN SYSTEM

EXPANDED SYSTEM COST

1.	Equipment	$50,700
2.	Cable System Modifications	$ 6,000
3.	Engineering and Installation	$ 6,000
	TOTAL	$68,700

EL PASO



FT. WORTH TTSD MICROWAVE/MDS SYSTEM CONFIGURATION

SOLID LINE = BASIC SYSTEM

BASIC SYSTEM COST

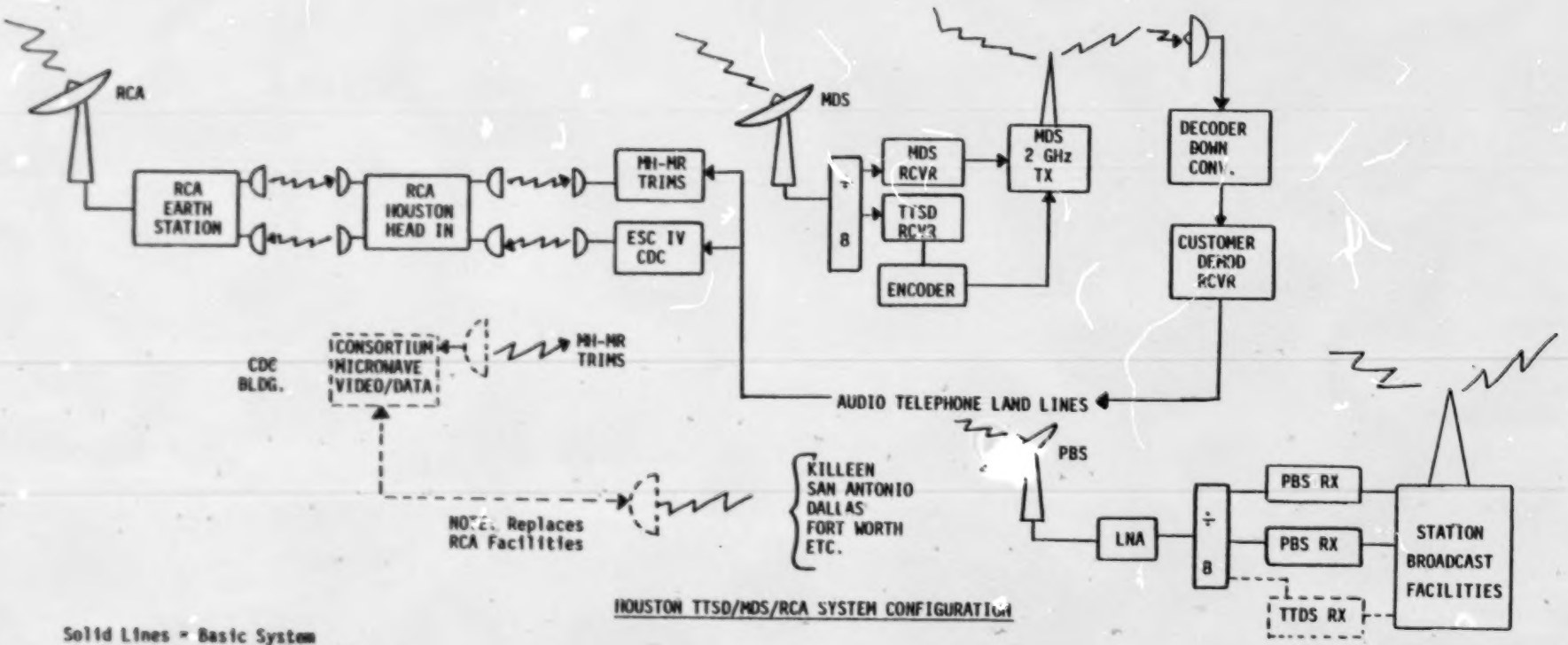
1. One hop mw system	$55,000
2. E&I	5,000
	$60,000

DASHED LINE = EXPANDED SYSTEM

EXPANDED SYSTEM COST

1. One hop mw system	55,000
2. Engineering	3,000
3. Engineering and Installation	5,000
	$63,000

FT. WORTH



HOUSTON TTSD/MDS/RCA SYSTEM CONFIGURATION

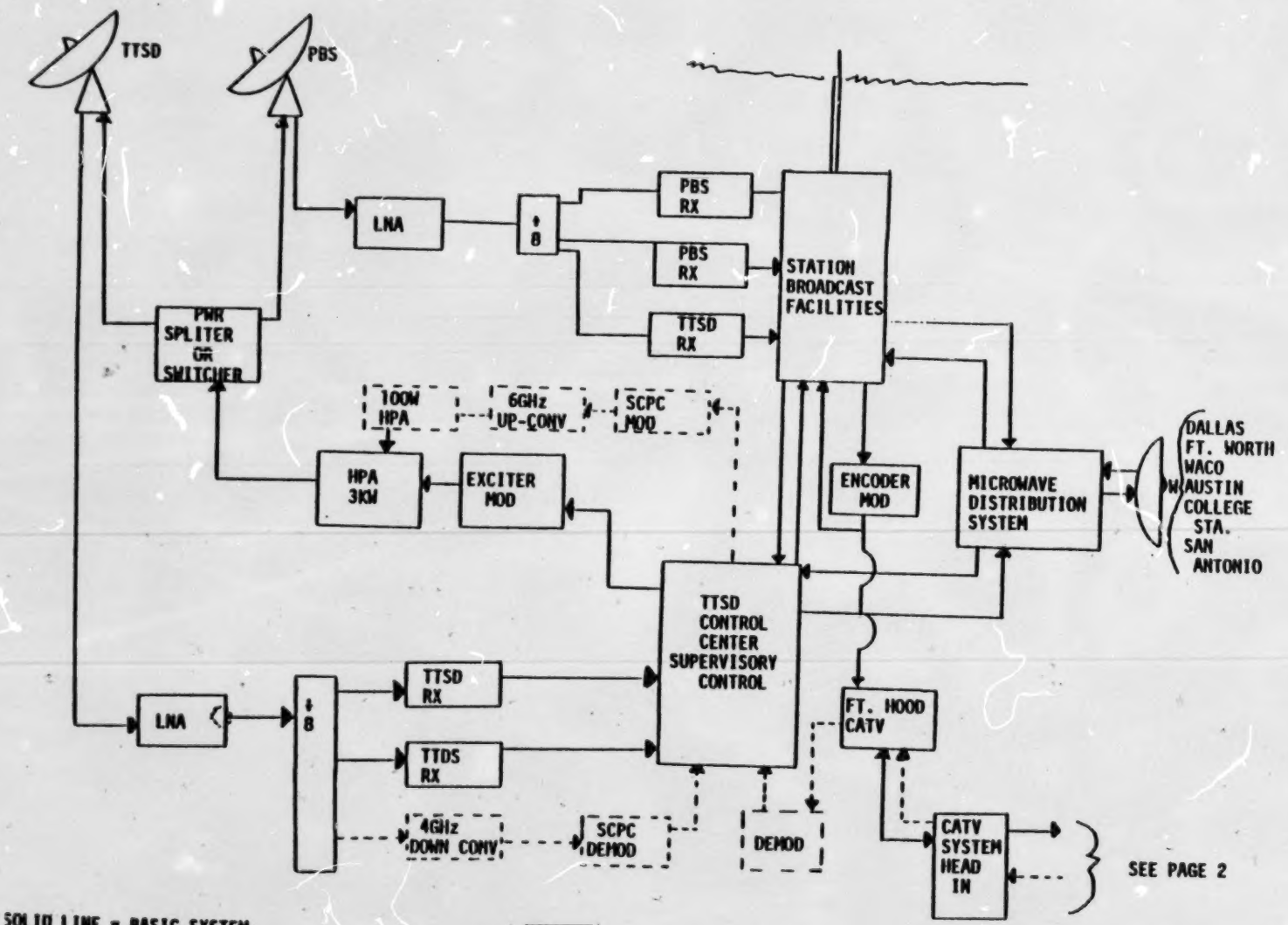
Solid Lines = Basic System
Dashed Lines = Expanded System

Basic System Cost

1. Equipment	$21,500
2. 2 1-hop M/W System	110,000
3. Engineering and Installation	15,000
	$146,500

Expanded System Cost

1. Equipment	$8,500
2. 2 1-hop M/W System (move)	11,000
3. Engineering and Installation	3,000
	$22,500

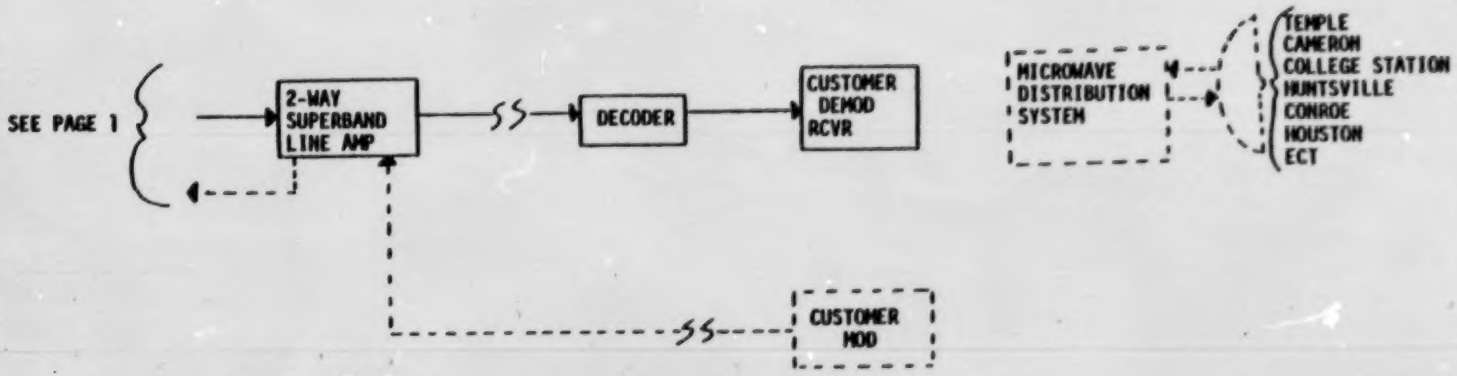


SOLID LINE = BASIC SYSTEM
DASHED LINE = EXPANDED SYSTEM

KILLEEN
TTSD/PBS T/RTV

PAGE 1 OF 2

KILLEEN



SOLID LINE = BASIC SYSTEM

DASHED LINE = EXPANDED SYSTEM

BASIC SYSTEM COST

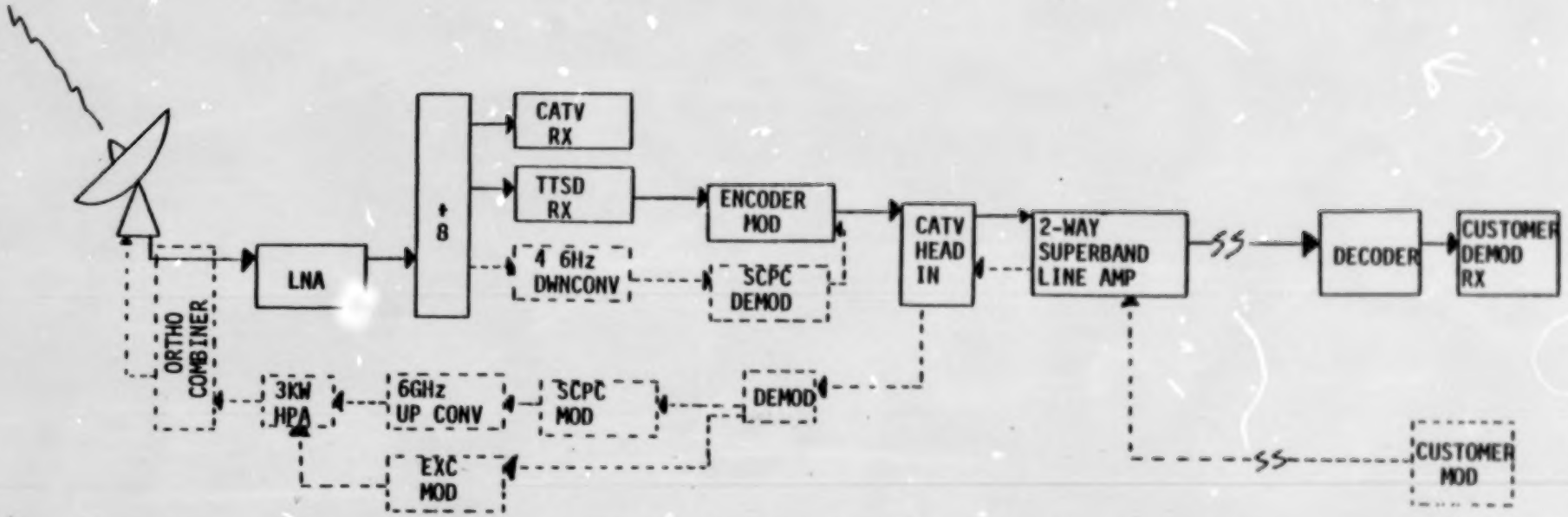
1.	Equipment	8,100
2.	Cable Sys. modification	21,600
3.	TTSD Control Center	130,000
4.	Shop mw system	231,000
5.	10 metre earth station	300,000
6.	E&I	35,000
	Total	$725,700

EXPANDED SYSTEM COST

1.	Equipment	146,195
2.	Mw system	1,269,000
3.	Existing mw update	450,000
4.	Engineering and Installation	15,000
	Total	$1,880,195

KILLEEN

KILLEEN
TTSD/PBS T/R-TV



LAREDO TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

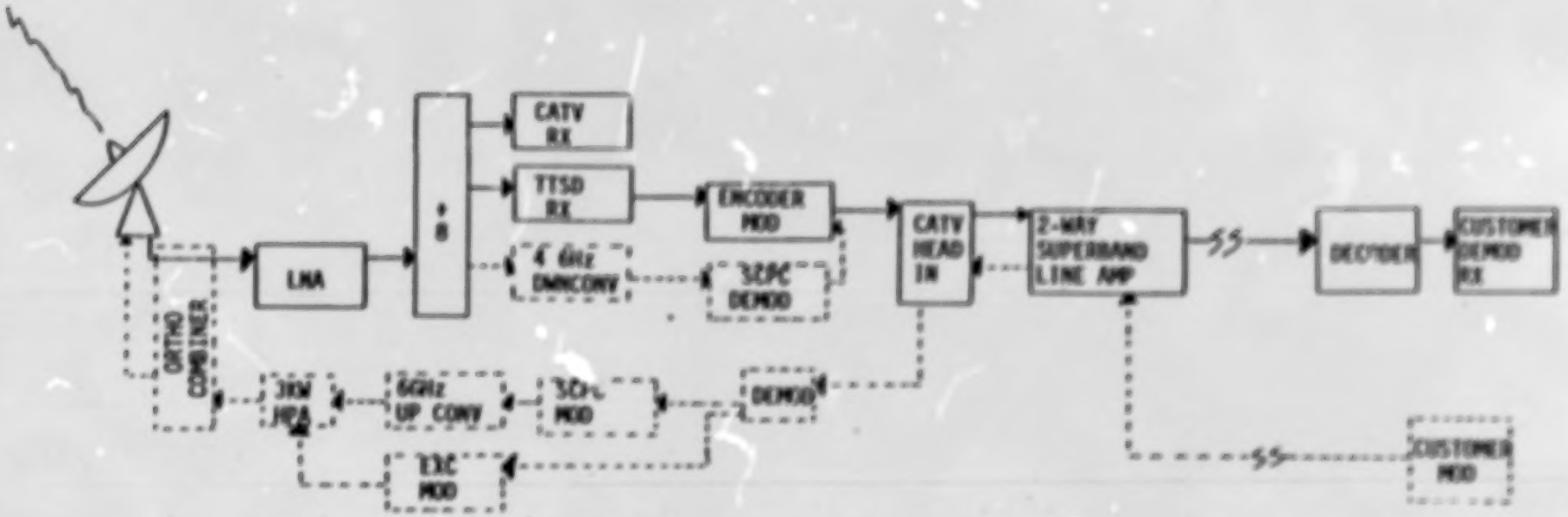
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modifications	$16,000
3.	Engineering and Installation	$ 5,000
	TOTAL	$29,500

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modifications	$ 3,632
3.	Engineering and Installation	$ 5,000
	TOTAL	$59,395

LAREDO



LUBBOCK TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE - EXPANDED 2-WAY TTSD SYSTEM

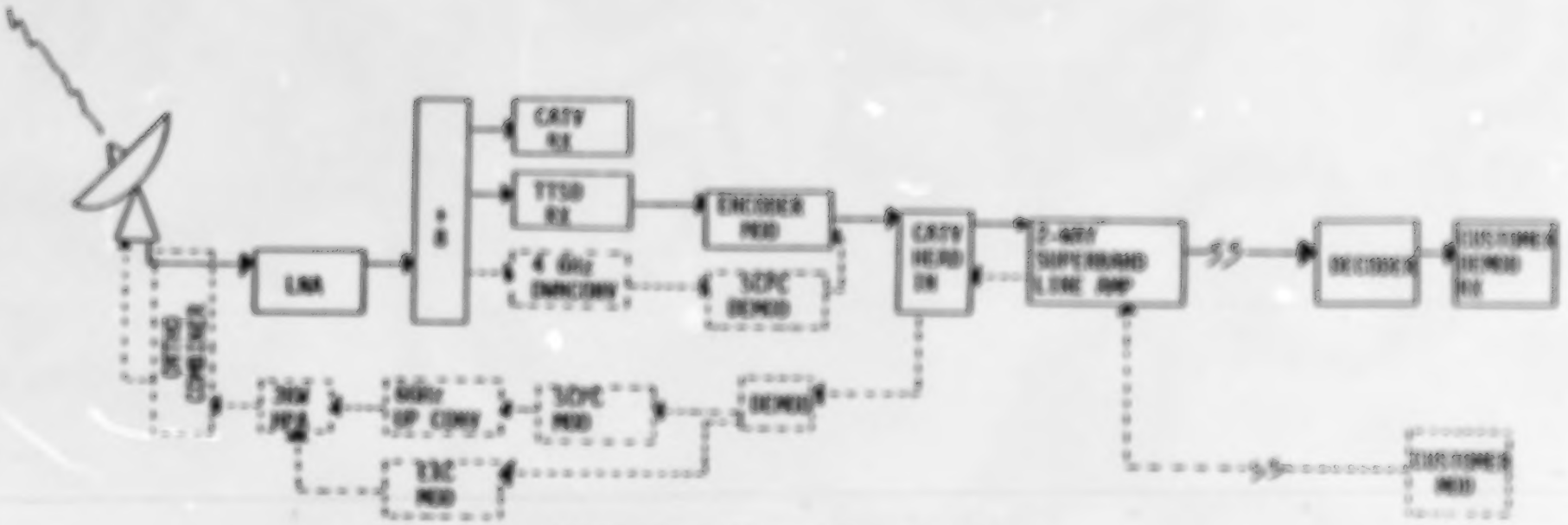
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modification	31,816
3.	Engineering and Installation	5,200
	TOTAL	$45,516

EXPANDED SYSTEM COST

1.	Equipment	$90,763
2.	Cable System Modification	6,264
3.	Engineering and Installation	5,200
	TOTAL	102,227

LUBBOCK



LUFKIN TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

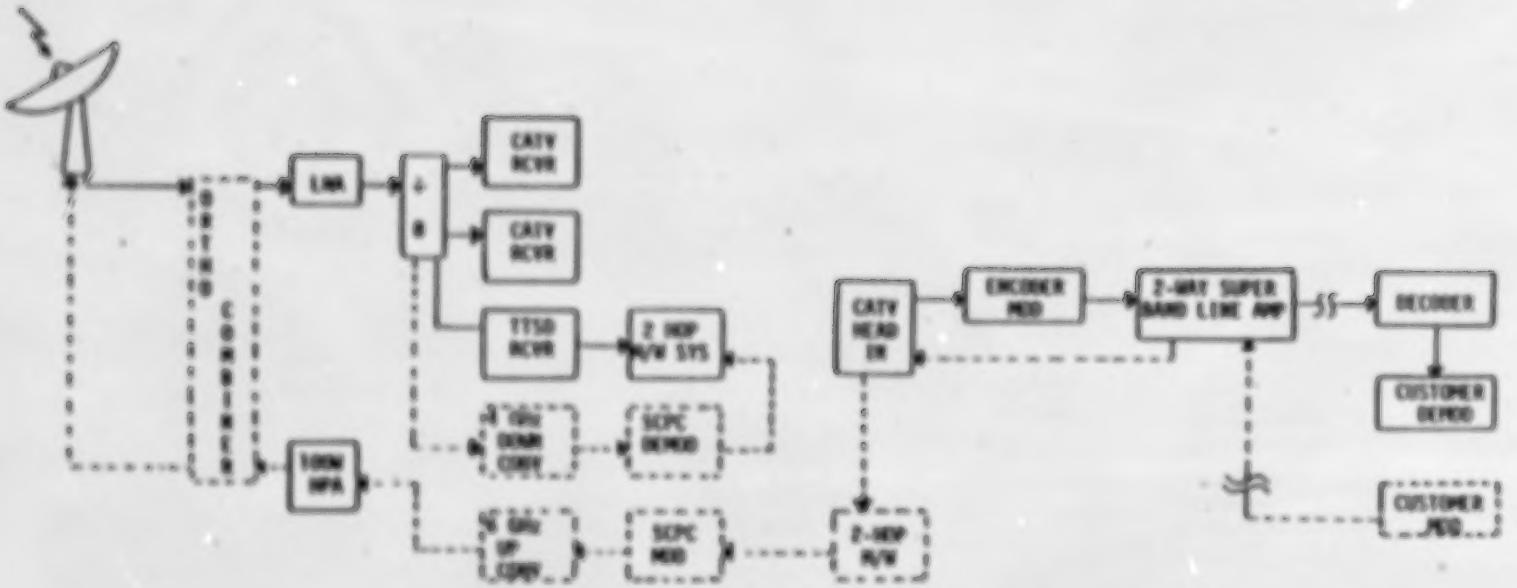
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modifications	$31,500
3.	Engineering and Installation	$ 5,000
	TOTAL	$45,000

DASHED LINE - EXPANDED D-AMY TTSD SYSTEM

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modifications	$ 3,632
3.	Engineering and Installation	$ 5,000
	TOTAL	$59,395



SAN ANGELO TTSD/CATV SYSTEM CONFIGURATION

Solid Line = Basic TTSD System
Dashed Line = Expanded TTSD System

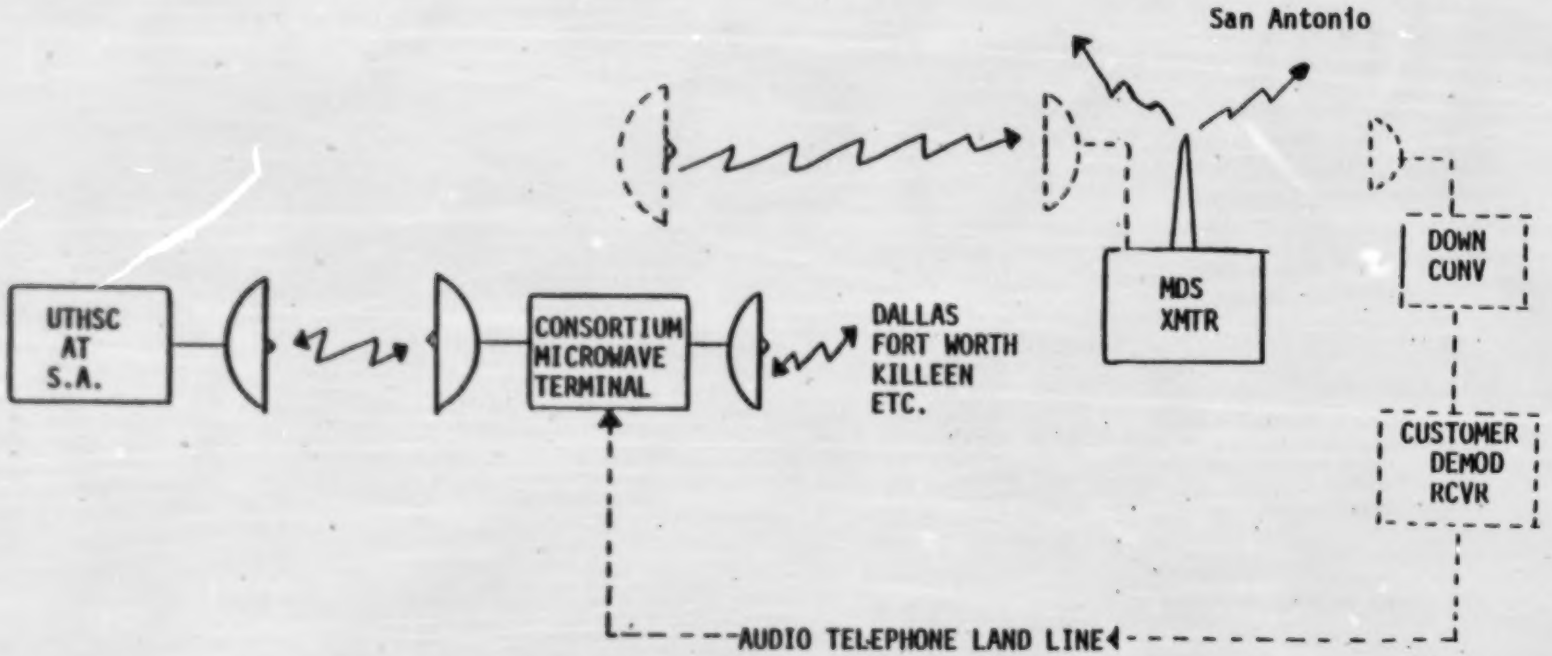
Basic System Cost

1.	Equipment	8,500
2.	Cable System mod	31,600
3.	2 Hop mw System	110,000
4.	Engineering and Installation	4,000
		$154,100

Expanded System Cost

1.	1 Hop mw system	64,000
2.	Equipment	53,395
3.	Engineering and Installation	4,000
		$121,395

SAN ANGELO



SAN ANTONIO TTSD SYSTEMS CONFIGURATION

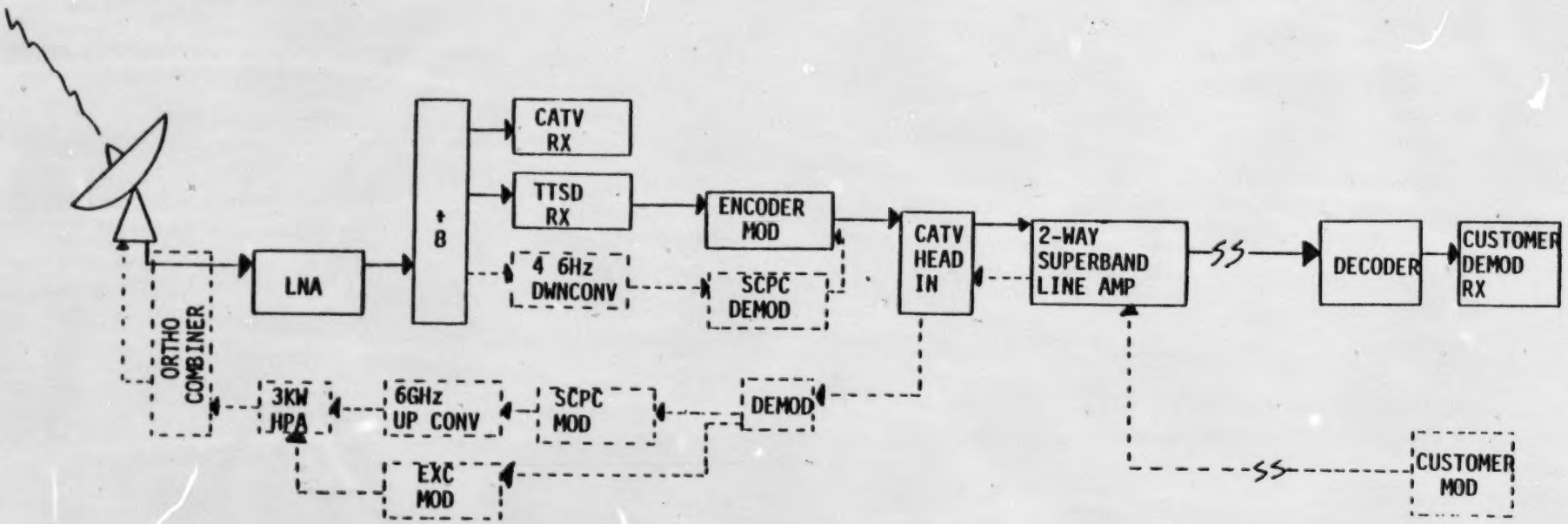
Solid Line = Basic System
Dashed Line = Expanded System

Basic System Cost

1. 1 Hop M/W System	$55,000
2. Engineering and Installation	4,000
	$59,000

Expanded System Cost

1. 1 Hop M/W System	$30,000
2. MDS Equipment	14,000
3. Engineering and Installation	4,000
	$48,000



UVALDE TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

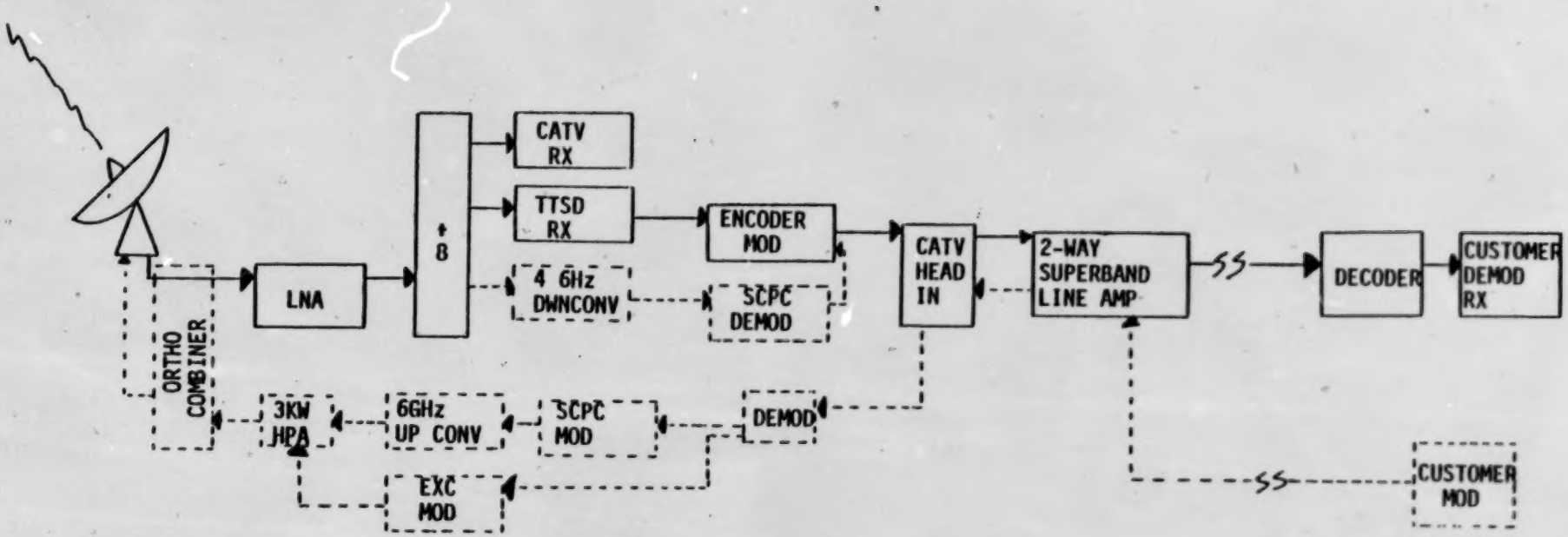
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modification	31,316
3.	Engineering and Installation	6,000
	TOTAL	$45,316

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modification	3,632
3.	Engineering and Installation	6,000
	TOTAL	$60,395

UVALDE



VERNON TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

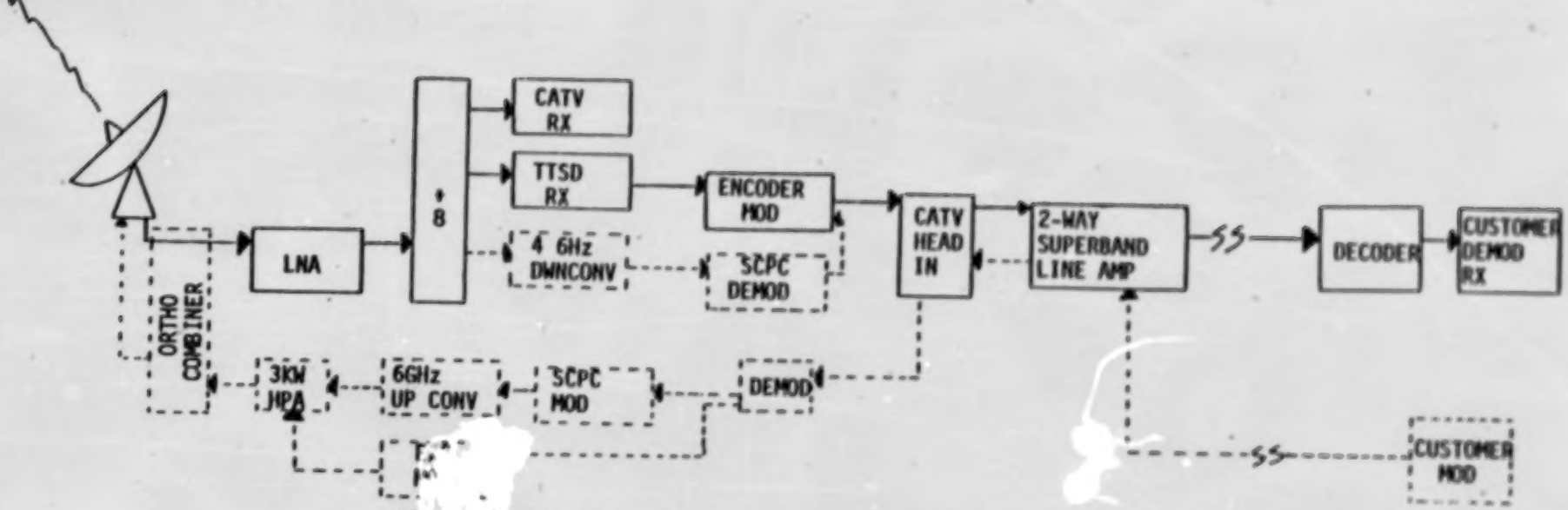
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modification	22,816
3.	Engineering and Installation	6,000
	TOTAL	$37,316

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modification	3,632
3.	Engineering and Installation	6,000
	TOTAL	$60,395

VERNON



WESLACO/HARLINGEN TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

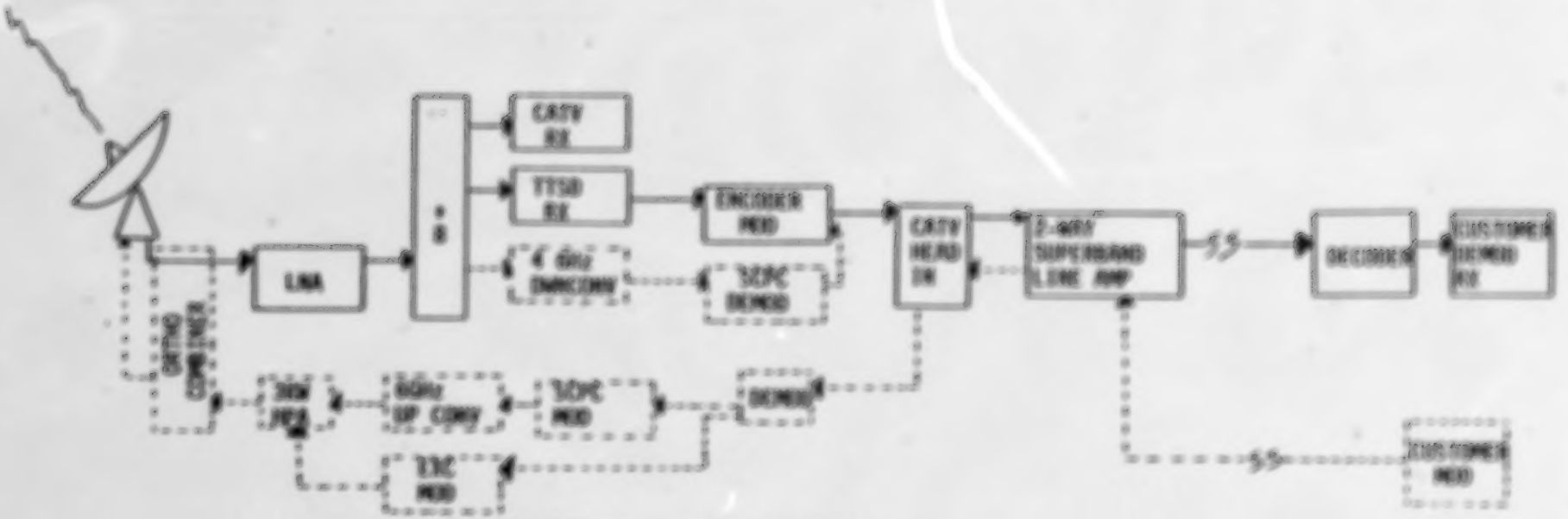
BASIC SYSTEM COST

1.	Equipment	$ 16,000
2.	Cable System Modifications	$ 74,948
3.	Two-Hop Microwave Systems	$100,000
4.	Engineering and Installation	$ 21,000
	TOTAL	$211,948

EXPANDED SYSTEM COST

1.	Equipment	$ 40,000
2.	Cable System Modifications	$ 4,948
3.	Two-Hop Microwave Systems	$ 60,000
4.	Engineering and Installation	$ 21,000
5.	Building	$ 8,000
	TOTAL	$133,948

PHASE II - B SITES



BIG SPRING TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

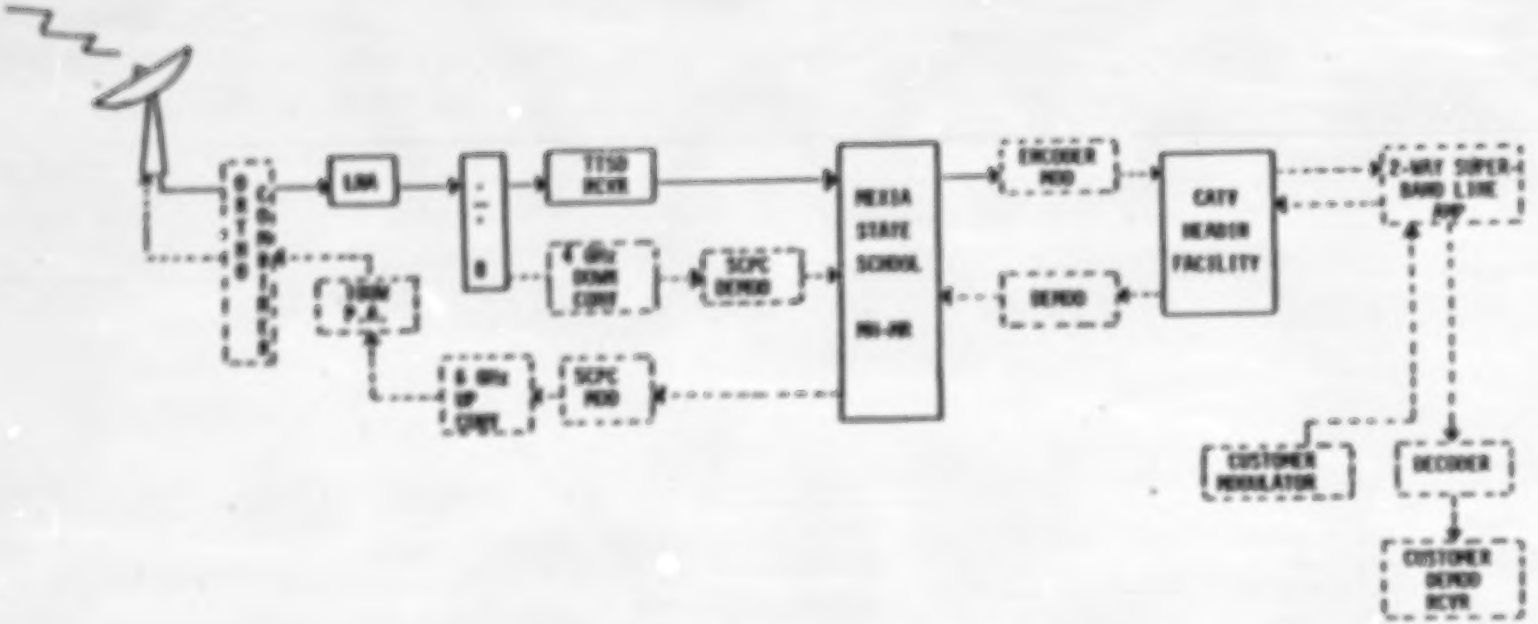
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modifications	$31,316
3.	Engineering and Installation	$ 6,000
	TOTAL	$45,816

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modifications	$ 3,632
3.	Engineering and Installation	$ 6,000
	TOTAL	$60,395

BIG SPRING



BRENHAM TTSO/CATV SYSTEM CONFIGURATION

Solid Line = Basic System
Dashed Line = Expanded System

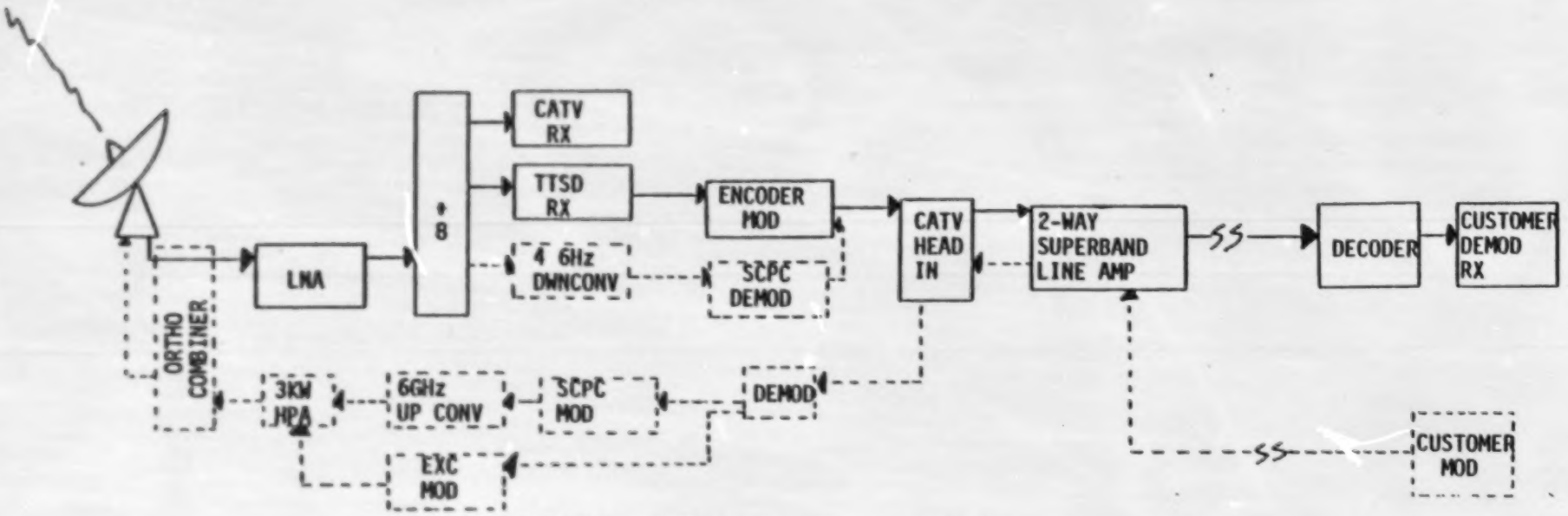
Basic System Cost

1.	Earth Terminal	$25,000
2.	Engineering & Installation	4,000
		$29,000

Expanded System Cost

1.	Equipment	$25,000
2.	Cable System Mod	10,000
3.	Engineering and Installation	5,000
		$40,000

BRENHAM



CLEAR LAKE TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

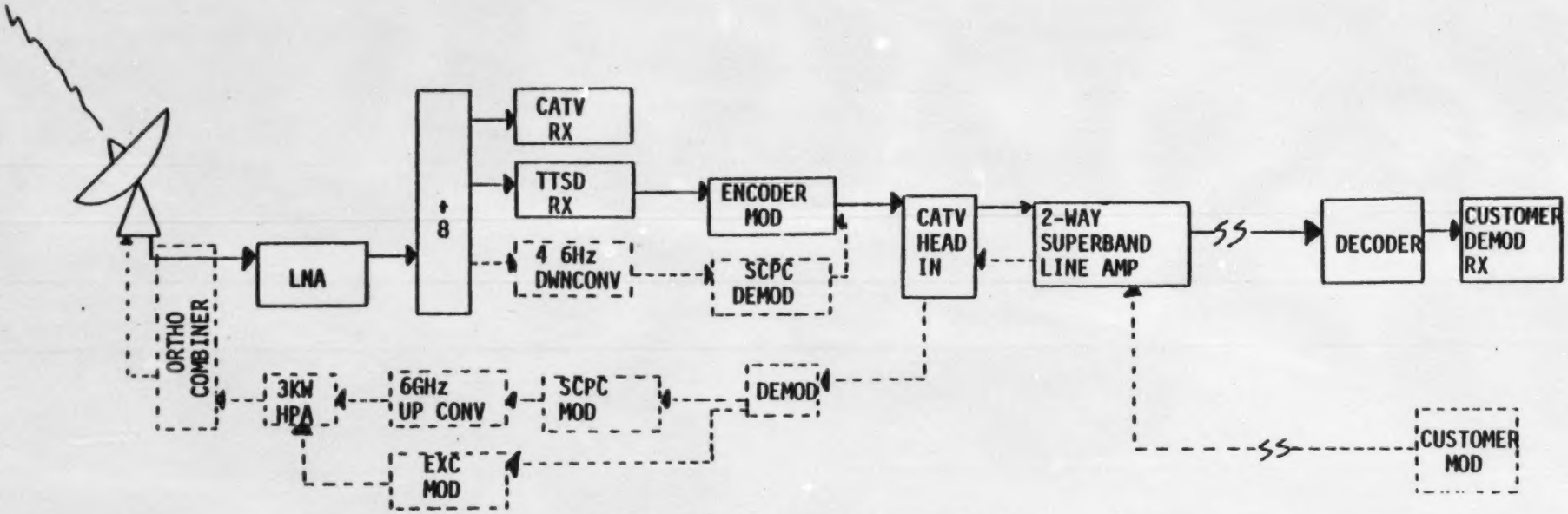
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modification	22,816
3.	Engineering and Installation	6,000
	TOTAL	$37,316

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modification	2,316
3.	Engineering and Installation	6,000
	TOTAL	$59,079

CLEAR LAKE



EDNA TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

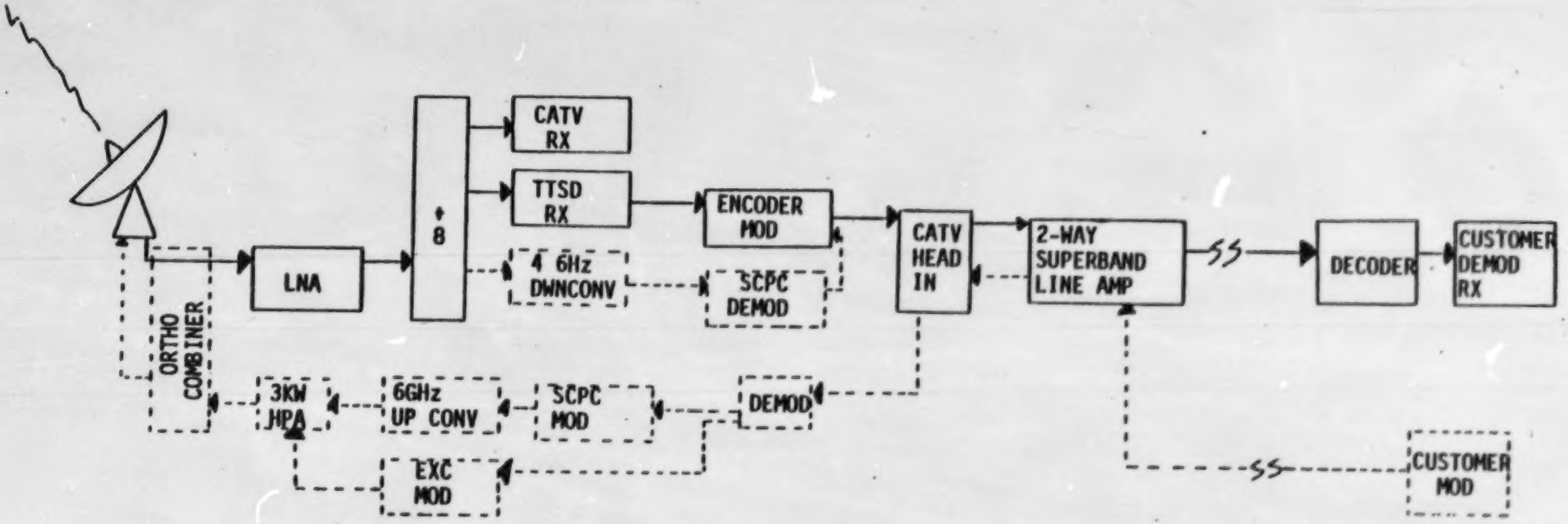
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modifications	$22,816
3.	Engineering and Installation	$ 6,000
	TOTAL	$37,316

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modifications	$ 2,316
3.	Engineering and Installation	$ 6,000
	TOTAL	$59,079

EDNA



FT. STOCKTON TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

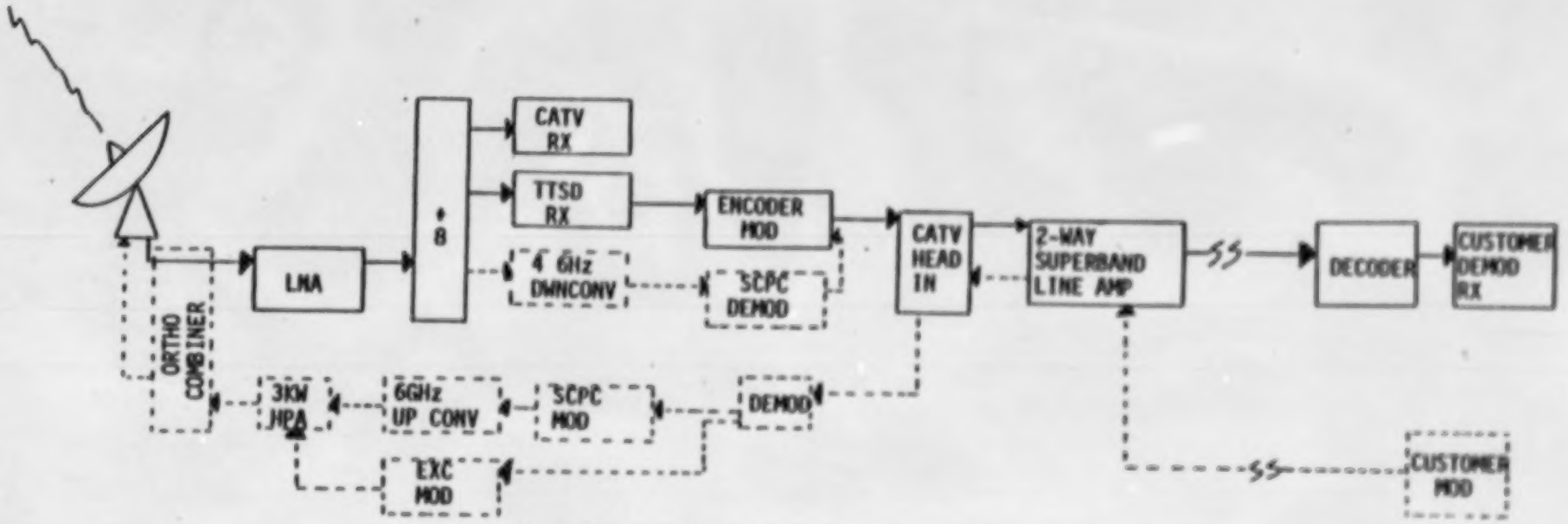
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modifications	$ 9,316
3.	Engineering and Installation	$ 6,000
	TOTAL	$23,816

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modifications	$ 2,316
3.	Engineering and Installation	$ 6,000
	TOTAL	$59,079

FT. STOCKTON



GALVESTON TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

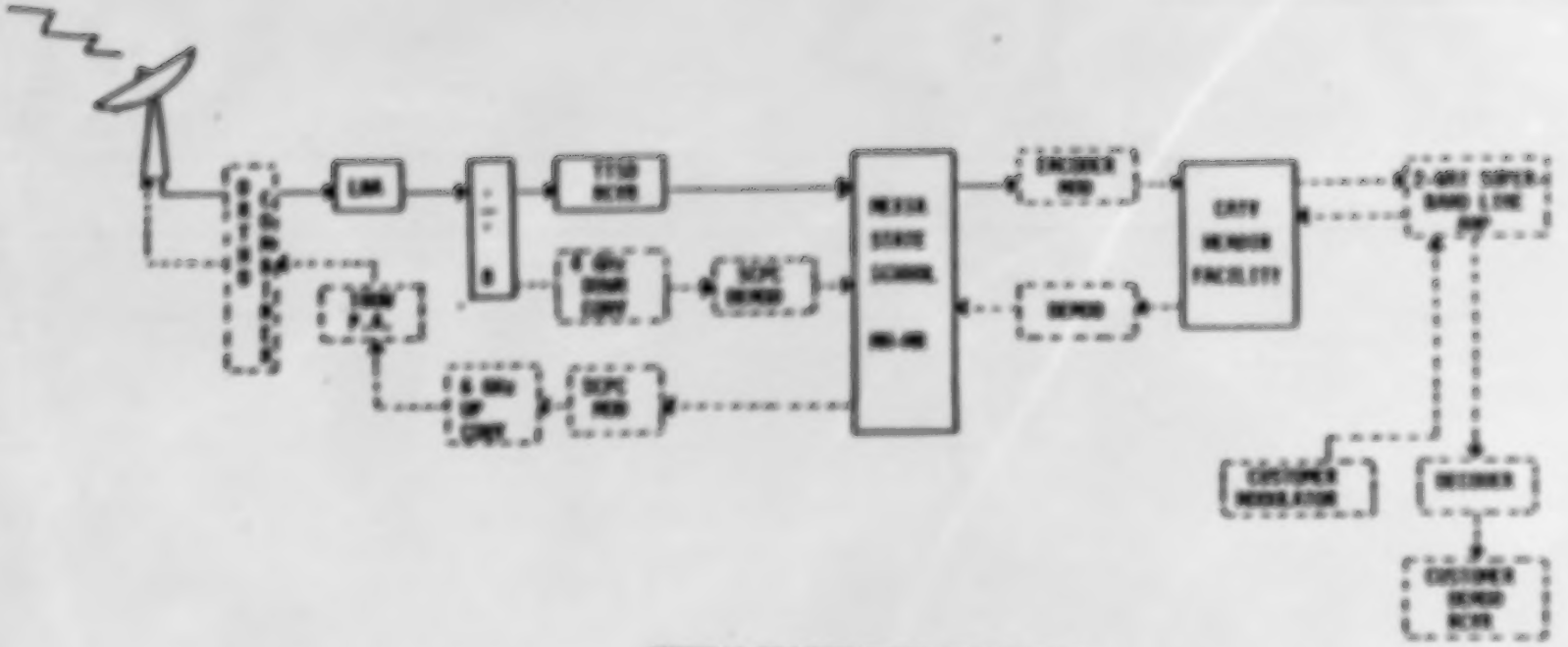
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modifications	$31,316
3.	Engineering and Installation	$ 6,000
	TOTAL	$45,316

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modifications	$ 2,316
3.	Engineering and Installation	$ 6,000
	TOTAL	$59,079

GALVESTON



KERRVILLE TTS&TCATV SYSTEM CONFIGURATION

Solid Line = Basic System
Dashed Line = Expanded System

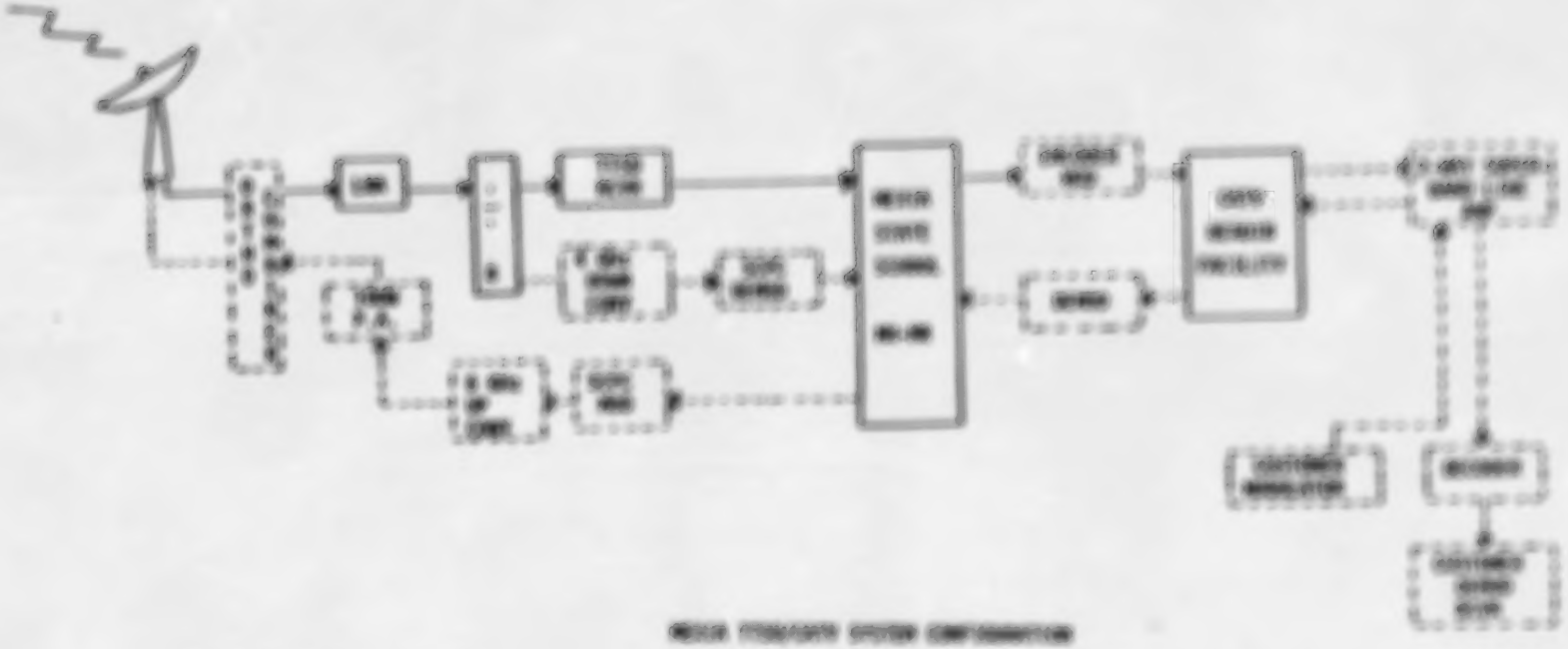
Basic System Cost

1. Earth Terminal	$15,000
2. Engineering & Installation	4,000
	$19,000

Expanded System Cost

1. Equipment	$30,763
2. Cable System Mod	25,916
3. Engineering and Installation	5,000
	$61,679

KERRVILLE



[redacted]

Solid Line = Basic System
Dashed Line = Expanded System

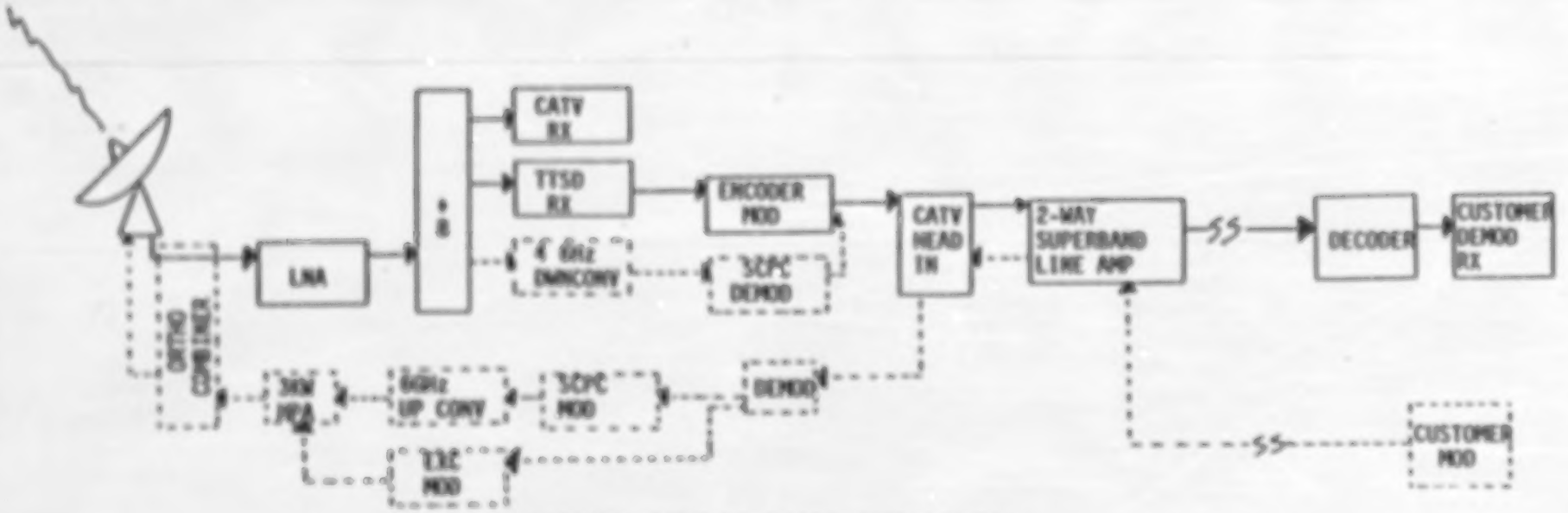
Basic System Cost:

1. [redacted]	[redacted]
2. [redacted]	[redacted]
	[redacted]

Expanded System Cost:

1. [redacted]	[redacted]
2. [redacted]	[redacted]
3. [redacted]	[redacted]
	[redacted]

[redacted]



MIDLAND TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

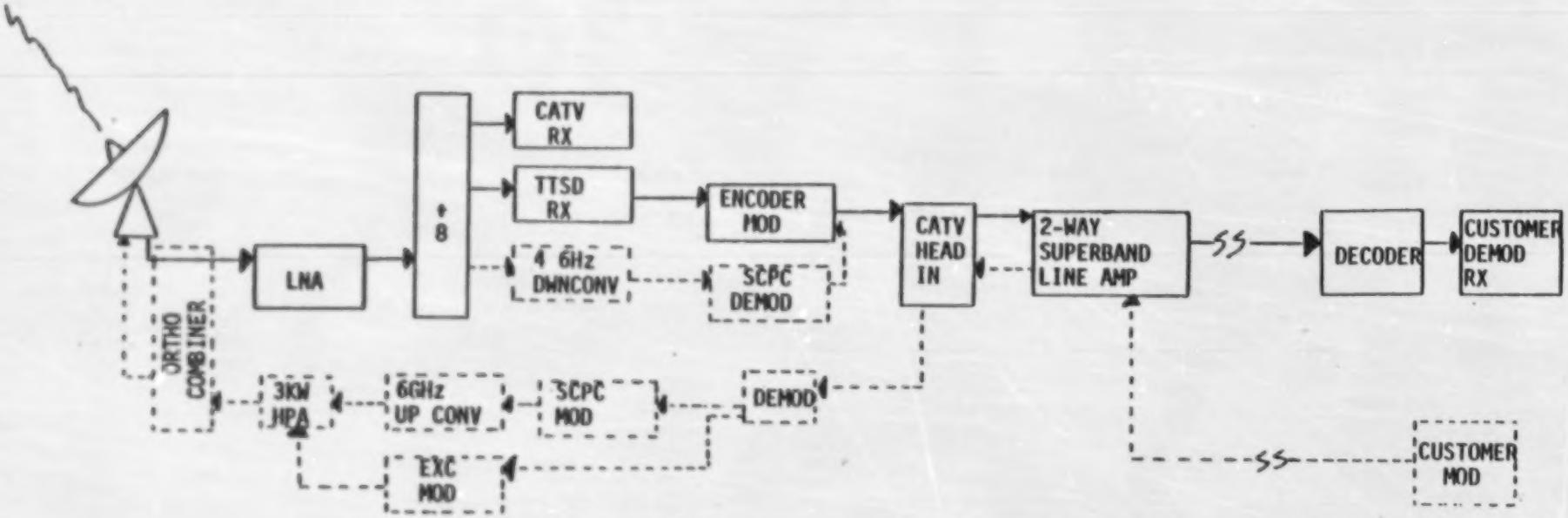
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modification	31,816
3.	Engineering and Installation	6,000
	TOTAL	$45,516

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modification	3,632
3.	Engineering and Installation	6,000
	TOTAL	$60,395

MIDLAND



ODESSA TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

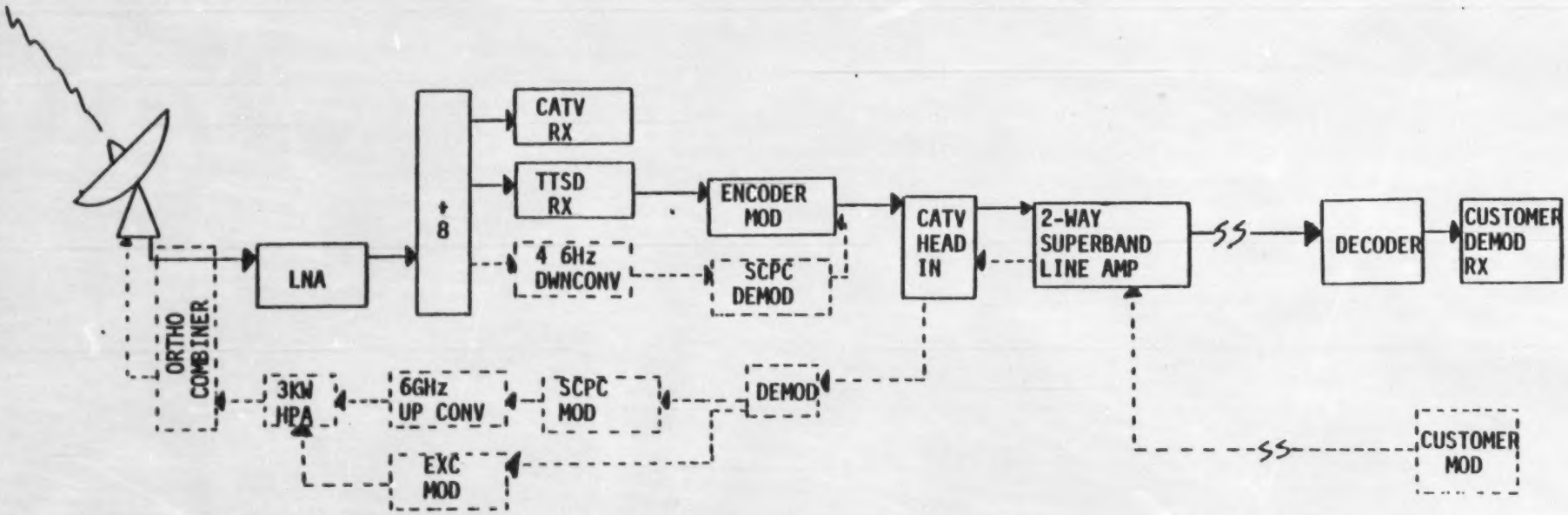
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modification	31,316
3.	Engineering and Installation	6,000
	TOTAL	$45,816

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modification	2,316
3.	Engineering and Installation	6,000
	TOTAL	$59,079

ODESSA



OVERTON TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

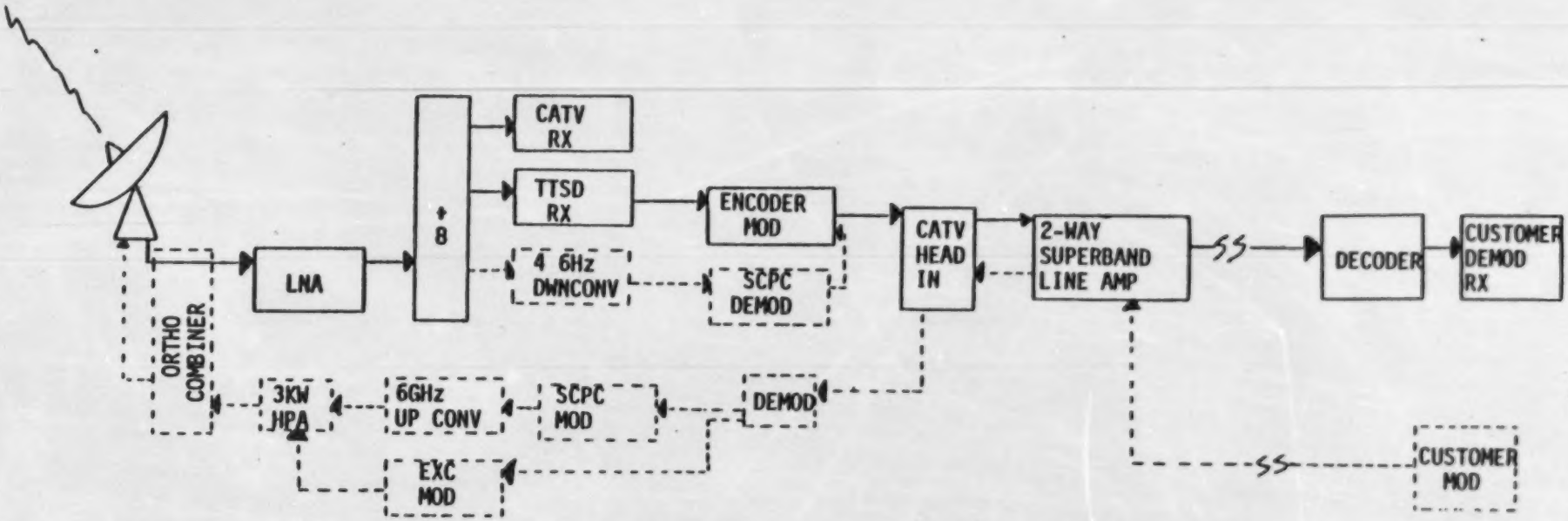
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modification	22,816
3.	Engineering and Installation	6,000
	TOTAL	$37,316

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modification	2,316
3.	Engineering and Installation	6,000
	TOTAL	$59,079

OVERTON



PAMPA TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

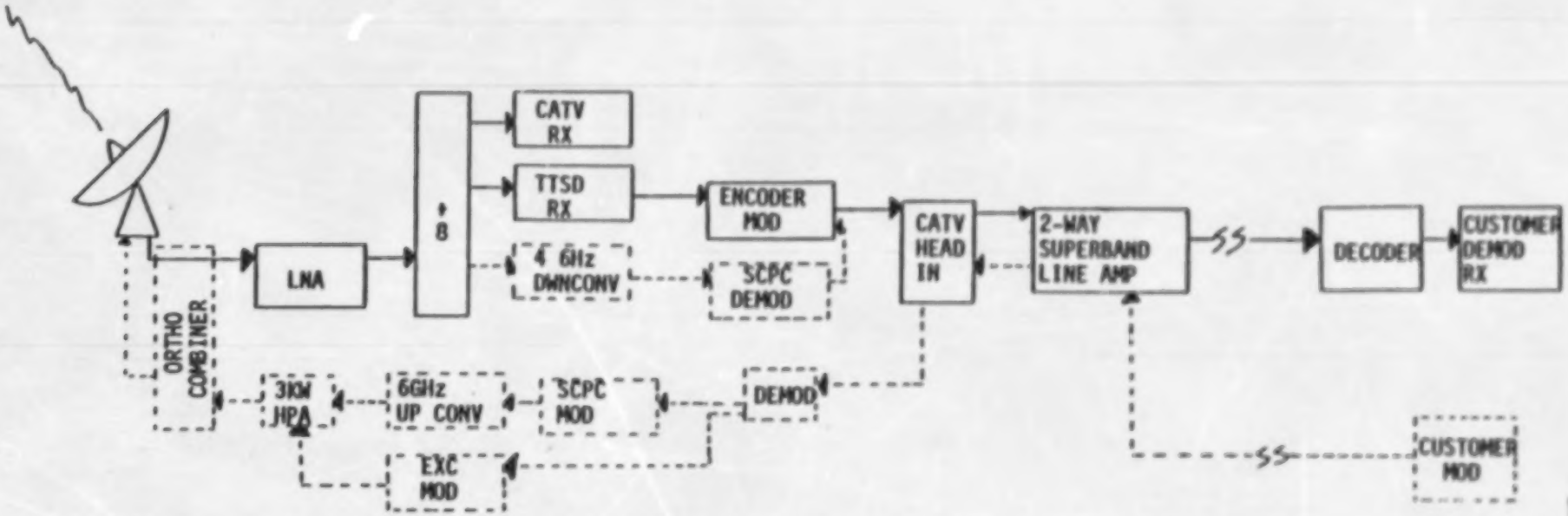
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modification	31,316
3.	Engineering and Installation	6,000
	TOTAL	$45,816

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modification	2,316
3.	Engineering and Installation	6,000
	TOTAL	$59,079

PAMPA



PASADENA TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSD SYSTEM

BASIC SYSTEM COST

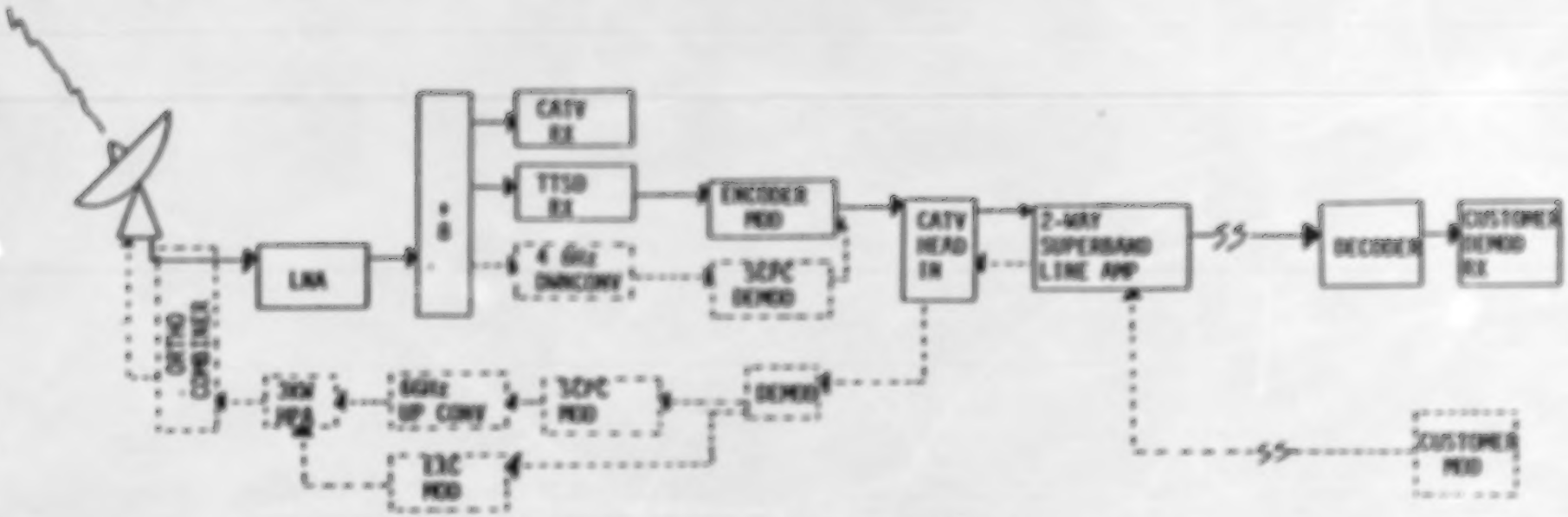
1.	Equipment	$ 8,500
2.	Cable System Modification	31,316
3.	Engineering and Installation	6,000
	TOTAL	$45,816

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modification	2,316
3.	Engineering and Installation	6,000
	TOTAL	$59,079

PASADENA

347



PORT LAVACA TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE - EXPANDED 2-WAY TTSD SYSTEM

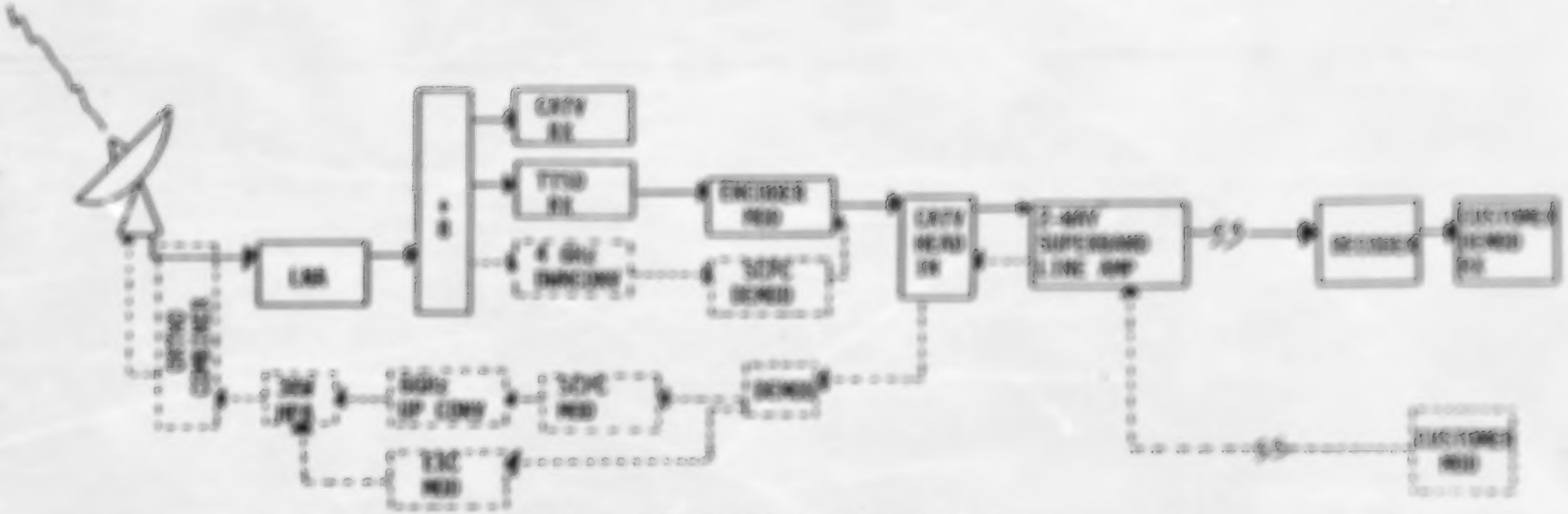
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modification	31,316
3.	Engineering and Installation	6,000
	TOTAL	$45,816

EXPANDED SYSTEM COST

1.	Equipment	$50,763
2.	Cable System Modification	2,316
3.	Engineering and Installation	6,000
	TOTAL	$59,079

PORT LAVACA



[illegible] TTSU/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSU SYSTEM

DASHED LINE = EXPANDED 2-WAY TTSU SYSTEM

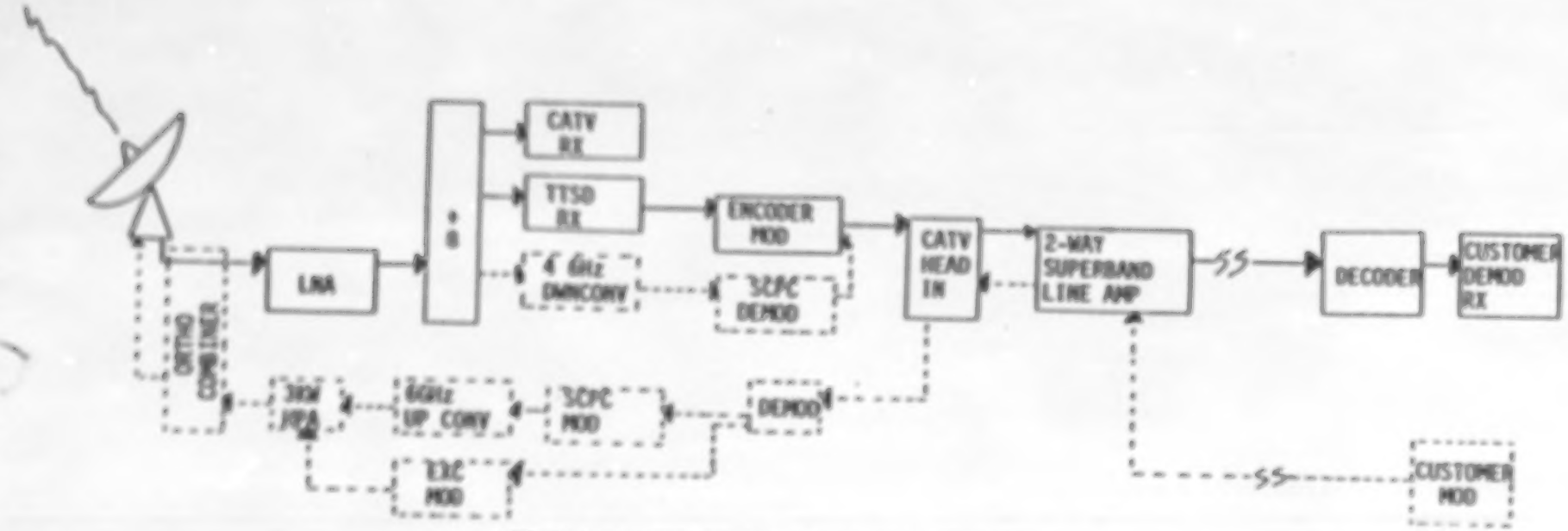
BASIC SYSTEM COST

1.	Equipment	$ 8,500
2.	Cable System Modification	22,856
3.	Engineering and Installation	6,000
	TOTAL	$37,356

EXPANDED SYSTEM COST

1.	Equipment	$51,763
2.	Cable System Modification	2,356
3.	Engineering and Installation	6,000
	TOTAL	$59,070

RUSK



TEXAS CITY TTSD/CATV SYSTEM CONFIGURATION

SOLID LINE - BASIC TTSD SYSTEM

DASHED LINE - EXPANDED 2-WAY TTSD SYSTEM

BASIC SYSTEM COST

1. Equipment	$ 8,500
2. Cable System Modification	31,316
3. Engineering and Installation	6,000
TOTAL	$45,816

EXPANDED SYSTEM COST

1. Equipment	$50,763
2. Cable System Modification	2,316
3. Engineering and Installation	6,000
TOTAL	$59,079

TEXAS CITY